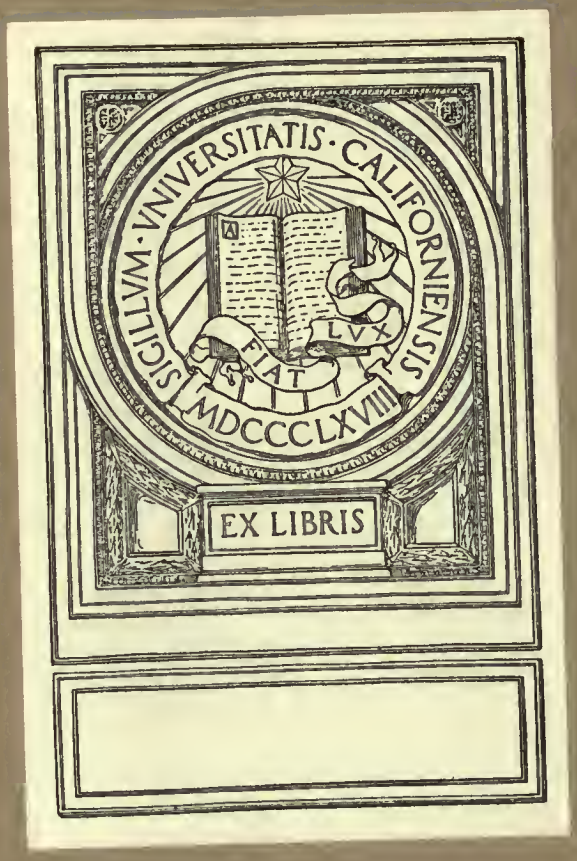

SIGILLVM · VNIVERSITATIS · CALIFORNIENSIS
FIAT LVX
MDCCCLXVIII
EX LIBRIS

THREE AND FOUR PLACE

TABLES

OF

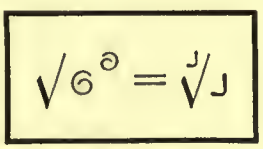
LOGARITHMIC AND TRIGONOMETRIC

FUNCTIONS

BY

JAMES MILLS PEIRCE

UNIVERSITY PROFESSOR OF MATHEMATICS IN HARVARD UNIVERSITY



BOSTON

GINN BROTHERS

1871

PROPORTIONAL PARTS.

	5					10					15					20					
1	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	1
2	0.2	0.4	0.6	0.8	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4	2.6	2.8	3.0	3.2	3.4	3.6	3.8	4.0	2
3	0.3	0.6	0.9	1.2	1.5	1.8	2.1	2.4	2.7	3.0	3.3	3.6	3.9	4.2	4.5	4.8	5.1	5.4	5.7	6.0	3
4	0.4	0.8	1.2	1.6	2.0	2.4	2.8	3.2	3.6	4.0	4.4	4.8	5.2	5.6	6.0	6.4	6.8	7.2	7.6	8.0	4
5	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	5
6	0.6	1.2	1.8	2.4	3.0	3.6	4.2	4.8	5.4	6.0	6.6	7.2	7.8	8.4	9.0	9.6	10.2	10.8	11.4	12.0	6
7	0.7	1.4	2.1	2.8	3.5	4.2	4.9	5.6	6.3	7.0	7.7	8.4	9.1	9.8	10.5	11.2	11.9	12.6	13.3	14.0	7
8	0.8	1.6	2.4	3.2	4.0	4.8	5.6	6.4	7.2	8.0	8.8	9.6	10.4	11.2	12.0	12.8	13.6	14.4	15.2	16.0	8
9	0.9	1.8	2.7	3.6	4.5	5.4	6.3	7.2	8.1	9.0	9.9	10.8	11.7	12.6	13.5	14.4	15.3	16.2	17.1	18.0	9

	25					30					35					40					
1	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	4.0	1
2	4.2	4.4	4.6	4.8	5.0	5.2	5.4	5.6	5.8	6.0	6.2	6.4	6.6	6.8	7.0	7.2	7.4	7.6	7.8	8.0	2
3	6.3	6.6	6.9	7.2	7.5	7.8	8.1	8.4	8.7	9.0	9.3	9.6	9.9	10.2	10.5	10.8	11.1	11.4	11.7	12.0	3
4	8.4	8.8	9.2	9.6	10.0	10.4	10.8	11.2	11.6	12.0	12.4	12.8	13.2	13.6	14.0	14.4	14.8	15.2	15.6	16.0	4
5	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5	15.0	15.5	16.0	16.5	17.0	17.5	18.0	18.5	19.0	19.5	20.0	5
6	12.6	13.2	13.8	14.4	15.0	15.6	16.2	16.8	17.4	18.0	18.6	19.2	19.8	20.4	21.0	21.6	22.2	22.8	23.4	24.0	6
7	14.7	15.4	16.1	16.8	17.5	18.2	18.9	19.6	20.3	21.0	21.7	22.4	23.1	23.8	24.5	25.2	25.9	26.6	27.3	28.0	7
8	16.8	17.6	18.4	19.2	20.0	20.8	21.6	22.4	23.2	24.0	24.8	25.6	26.4	27.2	28.0	28.8	29.6	30.4	31.2	32.0	8
9	18.9	19.8	20.7	21.6	22.5	23.4	24.3	25.2	26.1	27.0	27.9	28.8	29.7	30.6	31.5	32.4	33.3	34.2	35.1	36.0	9

	45					50					55					60					
1	4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8	4.9	5.0	5.1	5.2	5.3	5.4	5.5	5.6	5.7	5.8	5.9	6.0	1
2	8.2	8.4	8.6	8.8	9.0	9.2	9.4	9.6	9.8	10.0	10.2	10.4	10.6	10.8	11.0	11.2	11.4	11.6	11.8	12.0	2
3	12.3	12.6	12.9	13.2	13.5	13.8	14.1	14.4	14.7	15.0	15.3	15.6	15.9	16.2	16.5	16.8	17.1	17.4	17.7	18.0	3
4	16.4	16.8	17.2	17.6	18.0	18.4	18.8	19.2	19.6	20.0	20.4	20.8	21.2	21.6	22.0	22.4	22.8	23.2	23.6	24.0	4
5	20.5	21.0	21.5	22.0	22.5	23.0	23.5	24.0	24.5	25.0	25.5	26.0	26.5	27.0	27.5	28.0	28.5	29.0	29.5	30.0	5
6	24.6	25.2	25.8	26.4	27.0	27.6	28.2	28.8	29.4	30.0	30.6	31.2	31.8	32.4	33.0	33.6	34.2	34.8	35.4	36.0	6
7	28.7	29.4	30.1	30.8	31.5	32.2	32.9	33.6	34.3	35.0	35.7	36.4	37.1	37.8	38.5	39.2	39.9	40.6	41.3	42.0	7
8	32.8	33.6	34.4	35.2	36.0	36.8	37.6	38.4	39.2	40.0	40.8	41.6	42.4	43.2	44.0	44.8	45.6	46.4	47.2	48.0	8
9	36.9	37.8	38.7	39.6	40.5	41.4	42.3	43.2	44.1	45.0	45.9	46.8	47.7	48.6	49.5	50.4	51.3	52.2	53.1	54.0	9

	65					70					75					80					
1	6.1	6.2	6.3	6.4	6.5	6.6	6.7	6.8	6.9	7.0	7.1	7.2	7.3	7.4	7.5	7.6	7.7	7.8	7.9	8.0	1
2	12.2	12.4	12.6	12.8	13.0	13.2	13.4	13.6	13.8	14.0	14.2	14.4	14.6	14.8	15.0	15.2	15.4	15.6	15.8	16.0	2
3	18.3	18.6	18.9	19.2	19.5	19.8	20.1	20.4	20.7	21.0	21.3	21.6	21.9	22.2	22.5	22.8	23.1	23.4	23.7	24.0	3
4	24.4	24.8	25.2	25.6	26.0	26.4	26.8	27.2	27.6	28.0	28.4	28.8	29.2	29.6	30.0	30.4	30.8	31.2	31.6	32.0	4
5	30.5	31.0	31.5	32.0	32.5	33.0	33.5	34.0	34.5	35.0	35.5	36.0	36.5	37.0	37.5	38.0	38.5	39.0	39.5	40.0	5
6	36.6	37.2	37.8	38.4	39.0	39.6	40.2	40.8	41.4	42.0	42.6	43.2	43.8	44.4	45.0	45.6	46.2	46.8	47.4	48.0	6
7	42.7	43.4	44.1	44.8	45.5	46.2	46.9	47.6	48.3	49.0	49.7	50.4	51.1	51.8	52.5	53.2	53.9	54.6	55.3	56.0	7
8	48.8	49.6	50.4	51.2	52.0	52.8	53.6	54.4	55.2	56.0	56.8	57.6	58.4	59.2	60.0	60.8	61.6	62.4	63.2	64.0	8
9	54.9	55.8	56.7	57.6	58.5	59.4	60.3	61.2	62.1	63.0	63.9	64.8	65.7	66.6	67.5	68.4	69.3	70.2	71.1	72.0	9

	85					90					95					100					
1	8.1	8.2	8.3	8.4	8.5	8.6	8.7	8.8	8.9	9.0	9.1	9.2	9.3	9.4	9.5	9.6	9.7	9.8	9.9	10.0	1
2	16.2	16.4	16.6	16.8	17.0	17.2	17.4	17.6	17.8	18.0	18.2	18.4	18.6	18.8	19.0	19.2	19.4	19.6	19.8	20.0	2
3	24.3	24.6	24.9	25.2	25.5	25.8	26.1	26.4	26.7	27.0	27.3	27.6	27.9	28.2	28.5	28.8	29.1	29.4	29.7	30.0	3
4	32.4	32.8	33.2	33.6	34.0	34.4	34.8	35.2	35.6	36.0	36.4	36.8	37.2	37.6	38.0	38.4	38.8	39.2	39.6	40.0	4
5	40.5	41.0	41.5	42.0	42.5	43.0	43.5	44.0	44.5	45.0	45.5	46.0	46.5	47.0	47.5	48.0	48.5	49.0	49.5	50.0	5
6	48.6	49.2	49.8	50.4	51.0	51.6	52.2	52.8	53.4	54.0	54.6	55.2	55.8	56.4	57.0	57.6	58.2	58.8	59.4	60.0	6
7	56.7	57.4	58.1	58.8	59.5	60.2	60.9	61.6	62.3	63.0	63.7	64.4	65.1	65.8	66.5	67.2	67.9	68.6	69.3	70.0	7
8	64.8	65.6	66.4	67.2	68.0	68.8	69.6	70.4	71.2	72.0	72.8	73.6	74.4	75.2	76.0	76.8	77.6	78.4	79.2	80.0	8
9	72.9	73.8	74.7	75.6	76.5	77.4	78.3	79.2	80.1	81.0	81.9	82.8	83.7	84.6	85.5	86.4	87.3	88.2	89.1	90.0	9

Logarithms of Numbers.

	0	1	2	3	4	5	6	7	8	9	10
1	000	041	079	114	146	176	204	230	255	279	301
2	301	322	342	362	380	398	415	431	447	462	477
3	477	491	505	519	531	544	556	568	580	591	602
4	602	613	623	633	643	653	663	672	681	690	699
5	699	708	716	724	732	740	748	756	763	771	778
6	778	785	792	799	806	813	820	826	833	839	845
7	845	851	857	863	869	875	881	886	892	898	903
8	903	908	914	919	924	929	934	940	944	949	954
9	954	959	964	968	973	978	982	987	991	996	000
10	000	004	009	013	017	021	025	029	033	037	041

$\log \sin \varphi = \log (\varphi \text{ in degrees}) + S$
$\log \tan \varphi = \log (\varphi \text{ in degrees}) + T$

φ	S	φ	T
	8.242		8.242
$4^\circ.01$		$3^\circ.82$	
	8.241		8.243
		$6^\circ.12$	8.244
$7^\circ.83$		$7^\circ.70$	
	8.240		8.245
		$9^\circ.04$	8.246
$10^\circ.32$		$10^\circ.20$	

	Logarithmic sin	csc	tan	ctn	sec	cos	Natural sin	csc	tan	ctn	sec	cos	
1	8.242	1.758	8.242	1.758	0.000	0.000	0.017	57.30	0.017	57.29	1.000	1.000	89
2	.543	.457	.543	.457	.000	0.000	.035	28.65	.035	28.64	.001	0.999	88
3	.719	.281	.719	.281	.001	9.999	.052	19.11	.052	19.08	.001	.999	87
4	.844	.156	.845	.155	.001	.999	.070	14.34	.070	14.30	.002	.998	86
5	8.940	1.060	8.942	1.058	.002	.998	.087	11.47	.087	11.43	.004	.996	85
6	9.019	0.981	9.022	0.978	.002	.998	.105	9.57	.105	9.51	.006	.995	84
7	.086	.914	.089	.911	.003	.997	.122	8.21	.123	8.14	.008	.993	83
8	.144	.856	.148	.852	.004	.996	.139	7.19	.141	7.12	.010	.990	82
9	.194	.806	.200	.800	.005	.995	.156	6.39	.158	6.31	.012	.988	81
10	.240	.760	.246	.754	.007	.993	.174	5.76	.176	5.67	.015	.985	80
11	.281	.719	.289	.711	.008	.992	.191	5.24	.194	5.14	.019	.982	79
12	.318	.682	.327	.673	.010	.990	.208	4.81	.213	4.70	.022	.978	78
13	.352	.648	.363	.637	.011	.989	.225	4.45	.231	4.33	.026	.974	77
14	.384	.616	.397	.603	.013	.987	.242	4.13	.249	4.01	.031	.970	76
15	.413	.587	.428	.572	.015	.985	.259	3.86	.268	3.73	.035	.966	75
16	.440	.560	.457	.543	.017	.983	.276	3.63	.287	3.49	.040	.961	74
17	.466	.534	.485	.515	.019	.981	.292	3.42	.306	3.27	.046	.956	73
18	.490	.510	.512	.488	.022	.978	.309	3.24	.325	3.08	.051	.951	72
19	.513	.487	.537	.463	.024	.976	.326	3.07	.344	2.90	.058	.946	71
20	.534	.466	.561	.439	.027	.973	.342	2.92	.364	2.75	.064	.940	70
21	.554	.446	.584	.416	.030	.970	.358	2.79	.384	2.61	.071	.934	69
22	.574	.426	.606	.394	.033	.967	.375	2.67	.404	2.48	.079	.927	68
23	.592	.408	.628	.372	.036	.964	.391	2.56	.424	2.36	.086	.921	67
24	.609	.391	.649	.351	.039	.961	.407	2.46	.445	2.25	.095	.914	66
25	.626	.374	.669	.331	.043	.957	.423	2.37	.466	2.14	.103	.906	65
26	.642	.358	.688	.312	.046	.954	.438	2.28	.488	2.05	.113	.899	64
27	.657	.343	.707	.293	.050	.950	.454	2.20	.510	1.96	.122	.891	63
28	.672	.328	.726	.274	.054	.946	.469	2.13	.532	1.88	.133	.883	62
29	.686	.314	.744	.256	.058	.942	.485	2.06	.554	1.80	.143	.875	61
30	.699	.301	.761	.239	.062	.938	.500	2.00	.577	1.73	.155	.866	60
31	.712	.288	.779	.221	.067	.933	.515	1.94	.601	1.66	.167	.857	59
32	.724	.276	.796	.204	.072	.928	.530	1.89	.625	1.60	.179	.848	58
33	.736	.264	.813	.187	.076	.924	.545	1.84	.649	1.54	.192	.839	57
34	.748	.252	.829	.171	.081	.919	.559	1.79	.675	1.48	.206	.829	56
35	.759	.241	.845	.155	.087	.913	.574	1.74	.700	1.43	.221	.819	55
36	.769	.231	.861	.139	.092	.908	.588	1.70	.727	1.38	.236	.809	54
37	.779	.221	.877	.123	.098	.902	.602	1.66	.754	1.33	.252	.799	53
38	.789	.211	.893	.107	.103	.897	.616	1.62	.781	1.28	.269	.788	52
39	.799	.201	.908	.092	.109	.891	.629	1.59	.810	1.23	.287	.777	51
40	.808	.192	.924	.076	.116	.884	.643	1.56	.839	1.19	.305	.766	50
41	.817	.183	.939	.061	.122	.878	.656	1.52	.869	1.15	.325	.755	49
42	.826	.174	.954	.046	.129	.871	.669	1.49	.900	1.11	.346	.743	48
43	.834	.166	.970	.030	.136	.864	.682	1.47	.933	1.07	.367	.731	47
44	.842	.158	9.985	.015	.143	.857	.695	1.44	0.966	1.04	.390	.719	46
45	9.849	0.151	0.000	0.000	0.151	9.849	0.707	1.41	1.000	1.00	1.414	0.707	45
	cos	sec	ctn	tan	csc	sin	cos	sec	ctn	tan	csc	sin	o
	Logarithmic						Natural						

LOGARITHMS OF NUMBERS.

Angles.	Natural Numbers.	0	1	2	3	4	5	6	7	8	9	Proportional Parts. 1	2	3	4	5	6	7	8	9	10
1 40	10	0000	043	086	128	170	212	253	294	334	374	4.1	8.3	12.4	16.6	20.7	24.8	29.0	33.1	37.3	41.4
50	11	414	453	492	531	569	607	645	682	719	755	3.8	7.6	11.3	15.1	18.9	22.7	26.5	30.2	34.0	37.8
2 00	12	792	828	864	899	934	969	004	038	072	106	3.5	7.0	10.4	13.9	17.4	20.9	24.3	27.8	31.3	34.8
10	13	1139	173	206	239	271	303	335	367	399	430	3.2	6.4	9.7	12.9	16.1	19.3	22.5	25.7	29.0	32.2
20	14	461	492	523	553	584	614	644	673	703	732	3.0	6.0	9.0	12.0	15.0	18.0	21.0	24.0	27.0	30.0
30	15	1761	790	818	847	875	903	931	959	987	014	2.8	5.6	8.4	11.2	14.0	16.8	19.6	22.4	25.2	28.0
40	16	2041	068	095	122	148	175	201	227	253	279	2.6	5.3	7.9	10.5	13.2	15.8	18.4	21.1	23.7	26.3
50	17	304	330	355	380	405	430	455	480	504	529	2.5	5.0	7.4	9.9	12.4	14.9	17.4	19.9	22.3	24.8
3 00	18	553	577	601	625	648	672	695	718	742	765	2.3	4.7	7.0	9.4	11.7	14.1	16.4	18.8	21.1	23.5
10	19	788	810	833	856	878	900	923	945	967	989	2.2	4.5	6.7	8.9	11.1	13.4	15.6	17.8	20.0	22.3
20	20	3010	032	054	075	096	118	139	160	181	201	2.1	4.2	6.4	8.5	10.6	12.7	14.8	17.0	19.1	21.2
30	21	222	243	263	284	304	324	345	365	385	404	2.0	4.0	6.1	8.1	10.1	12.1	14.1	16.2	18.2	20.2
40	22	424	444	464	483	502	522	541	560	579	598	1.9	3.9	5.8	7.7	9.7	11.6	13.5	15.4	17.4	19.3
50	23	617	636	655	674	692	711	729	747	766	784	1.8	3.7	5.5	7.4	9.2	11.1	12.9	14.8	16.6	18.5
4 00	24	802	820	838	856	874	892	909	927	945	962	1.8	3.5	5.3	7.1	8.9	10.6	12.4	14.2	16.0	17.7
10	25	3979	997	014	031	048	065	082	099	116	133	1.7	3.4	5.1	6.8	8.5	10.2	11.9	13.6	15.3	17.0
20	26	4150	166	183	200	216	232	249	265	281	298	1.6	3.3	4.9	6.6	8.2	9.8	11.5	13.1	14.8	16.4
30	27	314	330	346	362	378	393	409	425	440	456	1.6	3.2	4.7	6.3	7.9	9.5	11.1	12.6	14.2	15.8
40	28	472	487	502	518	533	548	564	579	594	609	1.5	3.0	4.6	6.1	7.6	9.1	10.7	12.2	13.7	15.2
50	29	624	639	654	669	683	698	713	728	742	757	1.5	2.9	4.4	5.9	7.4	8.8	10.3	11.8	13.3	14.7
5 00	30	4771	786	800	814	829	843	857	871	886	900	1.4	2.8	4.3	5.7	7.1	8.5	10.0	11.4	12.8	14.2
10	31	914	928	942	955	969	983	997	011	024	038	1.4	2.8	4.1	5.5	6.9	8.3	9.7	11.0	12.4	13.8
20	32	5051	065	079	092	105	119	132	145	159	172	1.3	2.7	4.0	5.3	6.7	8.0	9.4	10.7	12.0	13.4
30	33	185	198	211	224	237	250	263	276	289	302	1.3	2.6	3.9	5.2	6.5	7.8	9.1	10.4	11.7	13.0
40	34	315	328	340	353	366	378	391	403	416	428	1.3	2.5	3.8	5.0	6.3	7.6	8.8	10.1	11.3	12.6
50	35	5441	453	465	478	490	502	514	527	539	551	1.2	2.4	3.7	4.9	6.1	7.3	8.6	9.8	11.0	12.2
6 00	36	563	575	587	599	611	623	635	647	658	670	1.2	2.4	3.6	4.8	5.9	7.1	8.3	9.5	10.7	11.9
10	37	682	694	705	717	729	740	752	763	775	786	1.2	2.3	3.5	4.6	5.8	6.9	8.1	9.3	10.4	11.6
20	38	798	809	821	832	843	855	866	877	888	899	1.1	2.3	3.4	4.5	5.6	6.8	7.9	9.0	10.2	11.3
30	39	911	922	933	944	955	966	977	988	999	010	1.1	2.2	3.3	4.4	5.5	6.6	7.7	8.8	9.9	11.0
40	40	6021	031	042	053	064	075	085	096	107	117	1.1	2.1	3.2	4.3	5.4	6.4	7.5	8.6	9.7	10.7
50	41	128	138	149	160	170	180	191	201	212	222	1.0	2.1	3.1	4.2	5.2	6.3	7.3	8.4	9.4	10.5
7 00	42	232	243	253	263	274	284	294	304	314	325	1.0	2.0	3.1	4.1	5.1	6.1	7.2	8.2	9.2	10.2
10	43	335	345	355	365	375	385	395	405	415	425	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0
20	44	435	444	454	464	474	484	493	503	513	522	1.0	2.0	2.9	3.9	4.9	5.9	6.8	7.8	8.8	9.8
30	45	6532	542	551	561	571	580	590	599	609	618	1.0	1.9	2.9	3.8	4.8	5.7	6.7	7.6	8.6	9.5
40	46	628	637	646	656	665	675	684	693	702	712	0.9	1.9	2.8	3.7	4.7	5.6	6.5	7.5	8.4	9.3
50	47	721	730	739	749	758	767	776	785	794	803	0.9	1.8	2.7	3.7	4.6	5.5	6.4	7.3	8.2	9.1
8 00	48	812	821	830	839	848	857	866	875	884	893	0.9	1.8	2.7	3.6	4.5	5.4	6.3	7.2	8.1	9.0
10	49	902	911	920	928	937	946	955	964	972	981	0.9	1.8	2.6	3.5	4.4	5.3	6.1	7.0	7.9	8.8
20	50	6990	998	007	016	024	033	042	050	059	067	0.9	1.7	2.6	3.4	4.3	5.2	6.0	6.9	7.7	8.6
30	51	7076	084	093	101	110	118	126	135	143	152	0.8	1.7	2.5	3.4	4.2	5.1	5.9	6.7	7.6	8.4
40	52	160	168	177	185	193	202	210	218	226	235	0.8	1.7	2.5	3.3	4.1	5.0	5.8	6.6	7.4	8.3
50	53	243	251	259	267	275	284	292	300	308	316	0.8	1.6	2.4	3.2	4.1	4.9	5.7	6.5	7.3	8.1
9 00	54	324	332	340	348	356	364	372	380	388	396	0.8	1.6	2.4	3.2	4.0	4.8	5.6	6.4	7.2	8.0

$\log \text{arc } \varphi = \log (\varphi \text{ in minutes}) + 6.4637 + \log \text{radius}.$
$\log \sin \varphi = \log (\varphi \text{ in minutes}) + S.$

φ		S
0	00.0	6.4637
1	51.5	6.4636
2	49.6	6.4635
3	32.3	6.4634
4	07.8	

φ		S
4	07.8	6.4633
4	38.8	6.4632
5	06.7	6.4631
5	32.3	6.4630
5	56.0	

Angles.	Natural Numbers.	0	1	2	3	4	5	6	7	8	9	Proportional Parts. 1	2	3	4	5	6	7	8	9	10
9 10	55	7404	412	419	427	435	443	451	459	466	474	0.8	1.6	2.3	3.1	3.9	4.7	5.5	6.3	7.0	7.8
20	56	482	490	497	505	513	520	528	536	543	551	0.8	1.5	2.3	3.1	3.8	4.6	5.4	8.1	6.9	7.7
30	57	559	566	574	582	589	597	604	612	619	627	0.8	1.5	2.3	3.0	3.8	4.5	5.3	6.0	6.8	7.6
40	58	634	642	649	657	664	672	679	686	694	701	0.7	1.5	2.2	3.0	3.7	4.5	5.2	5.9	6.7	7.4
50	59	709	716	723	731	738	745	752	760	767	774	0.7	1.5	2.2	2.9	3.6	4.4	5.1	5.8	6.6	7.3
10 00	60	7782	789	796	803	810	818	825	832	839	846	0.7	1.4	2.2	2.9	3.6	4.3	5.0	5.7	6.5	7.2
10	61	853	860	868	875	882	889	896	903	910	917	0.7	1.4	2.1	2.8	3.5	4.2	4.9	5.6	6.4	7.1
20	62	924	931	938	945	952	959	966	973	980	987	0.7	1.4	2.1	2.8	3.5	4.2	4.9	5.6	6.3	6.9
30	63	993	000	007	014	021	028	035	041	048	055	0.7	1.4	2.1	2.7	3.4	4.1	4.8	5.5	6.2	6.6
40	64	8062	069	075	082	089	096	102	109	116	122	0.7	1.3	2.0	2.7	3.4	4.0	4.7	5.4	6.1	6.7
50	65	8129	136	142	149	156	162	169	176	182	189	0.7	1.3	2.0	2.7	3.3	4.0	4.6	5.3	6.0	6.6
11 00	66	195	202	209	215	222	228	235	241	248	254	0.7	1.3	2.0	2.6	3.3	3.9	4.6	5.2	5.9	6.5
10	67	261	267	274	280	287	293	299	306	312	319	0.6	1.3	1.9	2.6	3.2	3.9	4.5	5.1	5.8	6.4
20	68	325	331	338	344	351	357	363	370	376	382	0.6	1.3	1.9	2.5	3.2	3.8	4.4	5.1	5.7	6.3
30	69	388	395	401	407	414	420	426	432	439	445	0.6	1.2	1.9	2.5	3.1	3.7	4.4	5.0	5.6	6.2
40	70	8451	457	463	470	476	482	488	494	500	506	0.6	1.2	1.8	2.5	3.1	3.7	4.3	4.9	5.5	6.2
50	71	513	519	525	531	537	543	549	555	561	567	0.6	1.2	1.8	2.4	3.0	3.6	4.3	4.9	5.5	6.1
12 00	72	573	579	585	591	597	603	609	615	621	627	0.6	1.2	1.8	2.4	3.0	3.6	4.2	4.8	5.4	6.0
10	73	633	639	645	651	657	663	669	675	681	686	0.6	1.2	1.8	2.4	3.0	3.5	4.1	4.7	5.3	5.9
20	74	692	698	704	710	716	722	727	733	739	745	0.6	1.2	1.7	2.3	2.9	3.5	4.1	4.7	5.2	5.8
30	75	8751	756	762	768	774	779	785	791	797	802	0.6	1.2	1.7	2.3	2.9	3.6	4.0	4.6	5.2	5.8
40	76	808	814	820	825	831	837	842	848	854	859	0.6	1.1	1.7	2.3	2.8	3.4	4.0	4.5	5.1	5.7
50	77	865	871	876	882	887	893	899	904	910	915	0.6	1.1	1.7	2.2	2.8	3.4	3.9	4.5	5.0	5.6
13 00	78	921	927	932	938	943	949	954	960	965	971	0.6	1.1	1.7	2.2	2.8	3.3	3.9	4.4	5.0	5.5
10	79	976	982	987	993	998	004	009	015	020	025	0.5	1.1	1.6	2.2	2.7	3.3	3.8	4.4	4.9	5.5
20	80	9031	036	042	047	053	058	063	069	074	079	0.5	1.1	1.6	2.2	2.7	3.2	3.8	4.3	4.9	5.4
30	81	085	090	096	101	106	112	117	122	128	133	0.5	1.1	1.6	2.1	2.7	3.2	3.7	4.3	4.8	5.3
40	82	138	143	149	154	159	165	170	175	180	186	0.5	1.1	1.6	2.1	2.6	3.2	3.7	4.2	4.7	5.3
50	83	191	196	201	206	212	217	222	227	232	238	0.5	1.0	1.6	2.1	2.6	3.1	3.6	4.2	4.7	5.2
14 00	84	243	248	253	258	263	269	274	279	284	289	0.5	1.0	1.5	2.1	2.6	3.1	3.6	4.1	4.6	5.1
10	85	9294	299	304	309	315	320	325	330	335	340	0.5	1.0	1.5	2.0	2.5	3.0	3.6	4.1	4.6	5.1
20	86	345	350	355	360	365	370	375	380	385	390	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0
30	87	395	400	405	410	415	420	425	430	435	440	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0
40	88	445	450	455	460	465	469	474	479	484	489	0.5	1.0	1.5	2.0	2.5	2.9	3.4	3.9	4.4	4.9
50	89	494	499	504	509	513	518	523	528	533	538	0.5	1.0	1.5	1.9	2.4	2.9	3.4	3.9	4.4	4.9
15 00	90	9542	547	552	557	562	566	571	576	581	586	0.5	1.0	1.4	1.9	2.4	2.9	3.4	3.8	4.3	4.8
10	91	590	595	600	605	609	614	619	624	628	633	0.5	0.9	1.4	1.9	2.4	2.8	3.3	3.8	4.3	4.7
20	92	638	643	647	652	657	661	666	671	675	680	0.5	0.9	1.4	1.9	2.3	2.8	3.3	3.8	4.2	4.7
30	93	685	689	694	699	703	708	713	717	722	727	0.5	0.9	1.4	1.9	2.3	2.5	3.3	3.7	4.2	4.6
40	94	731	736	741	745	750	754	759	763	768	773	0.5	0.9	1.4	1.8	2.3	2.5	3.2	3.7	4.1	4.6
50	95	9777	782	786	791	795	800	805	809	814	818	0.5	0.9	1.4	1.8	2.3	2.7	3.2	3.6	4.1	4.5
16 00	96	823	827	832	836	841	845	850	854	859	863	0.5	0.9	1.4	1.8	2.3	2.7	3.2	3.8	4.1	4.5
10	97	868	872	877	881	886	890	894	899	903	908	0.4	0.9	1.3	1.8	2.2	2.7	3.1	3.5	4.0	4.5
20	98	912	917	921	926	930	934	939	943	948	952	0.4	0.9	1.3	1.8	2.2	2.6	3.1	3.5	4.0	4.4
30	99	956	961	965	969	974	978	983	987	991	996	0.4	0.9	1.3	1.7	2.2	2.6	3.1	3.5	3.9	4.4

$$\log \tan \varphi = \log (\varphi \text{ in minutes}) + T.$$

φ ° ′	T	φ ° ′	T	φ ° ′	T
0 00.0	8.4637	3 06.0	6.4642	4 34.4	6.4647
0 44.2	8.4638	3 26.7	6.4643	4 48.9	6.4648
1 40.8	6.4639	3 45.6	6.4644	5 02.6	6.4649
2 15.2	6.4640	4 03.0	8.4645	5 15.8	6.4650
2 42.6	8.4641	4 19.2	6.4646	5 28.4	6.4651
3 06.0		4 34.4		5 40.5	

LOGARITHMS OF SUMS AND DIFFERENCES.

A	6.	7.	8.	9.	0.	1.	2.	3.
	B = 𝔊A.							
	0.00	0.00	0.00	0.0	0.	1.	2.	3.
00	00	04	43	414 9	3010 50	0414 91	0043 99	0004
01	0	4	4	23 9	061 51	505 91	142 99	104
02	0	5	5	32 9	111 51	596 91	241 99	204
03	0	5	6	42 10	163 52	687 91	340 99	304
04	0	5	7	52 10	215 52	779 92	439 99	404
05	00	05	48	462 10	3267 53	0871 92	0539 99	0504
06	0	5	50	72 10	321 53	963 92	638 99	604
07	1	5	1	82 11	374 54	1055 92	737 99	704
08	1	5	2	93 11	429 55	147 92	836 99	804
09	1	5	3	504 11	484 55	239 92	935 99	904
10	01	05	54	515 11	3539 56	1332 93	1034 99	1003
11	1	6	6	26 11	595 56	425 93	134 99	103
12	1	6	7	38 12	652 57	518 93	233 99	203
13	1	6	8	50 12	709 57	611 93	332 99	303
14	1	6	60	62 12	766 68	704 93	431 99	403
15	01	06	61	574 12	3825 59	1797 93	1531 99	1503
16	1	6	2	86 13	884 59	891 94	630 99	603
17	1	6	4	99 13	943 60	984 94	729 99	703
18	1	7	5	612 13	4003 60	2078 94	829 99	803
19	1	7	7	25 13	063 61	172 94	928 99	903
20	01	07	68	639 14	4124 61	2266 94	2027 99	2003
21	1	7	70	53 14	186 62	360 94	127 99	103
22	1	7	1	67 14	248 62	454 94	226 99	203
23	1	7	3	81 15	311 63	548 94	325 99	303
24	1	8	5	96 15	374 63	643 95	425 99	402
25	01	08	77	711 15	4438 64	2738 95	2524 99	2502
26	1	8	8	26 15	502 65	832 95	624 99	602
27	1	8	80	42 16	567 65	927 95	723 99	702
28	1	8	2	57 16	632 66	3022 95	823 99	802
29	1	8	4	74 16	698 66	117 95	922 99	902
30	01	09	86	790 17	4764 67	3212 95	3022 C	3002
31	1	9	8	807 17	831 67	308 95	121	102
32	1	9	90	24 17	899 68	403 95	221	202
33	1	9	2	41 18	966 68	499 96	320	302
34	1	9	4	59 18	5035 69	594 96	420	402
35	01	10	96	877 18	5104 69	3690 96	3519	3502
36	1	0	8	96 19	173 70	786 96	619	602
37	1	0	01	915 19	243 70	881 96	718	702
38	1	0	3	34 19	313 71	977 96	818	802
39	1	1	5	53 20	384 71	4073 96	918	902
40	01	11	08	973 20	5455 72	4170 96	4017	4002
41	1	1	10	93 20	527 72	266 96	117	102
42	1	1	3	014 21	599 72	362 96	216	202
43	1	2	5	35 21	672 73	458 96	316	302
44	1	2	8	57 22	745 73	555 96	416	402
45	01	12	21	078 22	5819 74	4651 97	4515	4502
46	1	3	3	101 22	893 74	748 97	615	602
47	1	3	6	23 23	967 75	845 97	715	701
48	1	3	9	46 23	6042 75	941 97	814	801
49	1	3	32	69 24	118 76	5038 97	914	901
50	01	14	35	193 24	6193 76	5135 97	5014	5001
	0.00	0.00	0.01	0.1	0.	1.	2.	3.

A	6.	7.	8.	9.	0.	1.	2.	3.
	B = 𝔊A.							
	0.00	0.00	0.0	0.	0.	1.	2.	3.
50	01	14	135	1193 24	6193 76	5135 97	5014	5001
51	1	4	38	218 24	269 76	232 97	113	101
52	1	4	41	242 25	346 77	329 97	213	201
53	1	5	45	267 25	423 77	426 97	313	301
54	2	5	48	293 26	501 78	523 97	413	401
55	02	15	151	1319 26	6578 78	5621 97	5512	5501
56	2	6	55	345 27	657 78	718 97	612	601
57	2	6	58	372 27	735 79	815 97	712	701
58	2	6	62	399 28	814 79	913 97	811	801
59	2	7	66	427 28	893 80	6010 97	911	901
60	02	17	170	1455 28	6973 80	6108 98	6011	6001
61	2	8	73	484 29	7053 80	205 98	111	101
62	2	8	77	513 29	134 81	303 98	210	201
63	2	8	81	543 30	215 81	401 98	310	301
64	2	9	86	573 30	296 81	498 98	410	401
65	02	19	190	1604 31	7377 82	6596 98	6510	6501
66	2	20	94	635 31	459 82	694 98	609	601
67	2	0	99	666 32	541 82	792 98	709	701
68	2	1	203	699 32	624 83	890 98	809	801
69	2	1	08	731 33	707 83	988 98	909	901
70	02	22	212	1764 33	7790 83	7086 98	7009	7001
71	2	2	17	798 34	874 84	184 98	108	101
72	2	3	22	832 34	957 84	282 98	208	201
73	2	3	27	867 35	8042 84	380 98	308	301
74	2	4	32	902 35	126 85	478 98	408	401
75	02	24	238	1938 36	8211 85	7577 98	7508	7501
76	2	5	43	974 37	296 85	675 98	608	601
77	3	5	48	2011 37	381 85	773 98	707	701
78	3	6	54	048 38	467 86	871 98	807	801
79	3	7	60	086 38	553 86	970 98	907	901
80	03	27	266	2124 39	8639 86	8068 98	8007	8001
81	3	8	72	163 39	725 87	167 98	107	101
82	3	9	78	203 40	812 87	265 99	207	201
83	3	9	84	243 40	899 87	364 99	306	301
84	3	30	91	284 41	986 87	462 99	406	401
85	03	31	297	2325 41	9074 88	8561 99	8506	8501
86	3	1	304	366 42	162 88	660 99	606	601
87	3	2	11	409 43	250 88	758 99	706	701
88	3	3	18	452 43	338 88	857 99	806	801
89	3	4	25	495 44	426 89	956 99	906	901
90	03	34	332	2539 44	9515 89	9054 99	9005	9001
91	4	5	39	584 45	604 89	153 99	105	101
92	4	6	47	629 45	693 89	252 99	205	201
93	4	7	55	674 46	782 89	351 99	305	301
94	4	8	63	721 47	872 90	450 99	405	400
95	04	39	371	2767 47	9962 90	9548 99	9505	9500
96	4	9	79	815 48	0052 90	647 99	605	600
97	4	40	87	863 48	142 90	746 99	705	700
98	4	1	96	911 49	232 91	845 99	805	800
99	4	2	405	961 49	323 91	944 99	904	900
o0	04	43	414	3010 50	0414 91	0043 99	0004	0000
	0.00	0.00	0.0	0.	1.	2.	3.	4.

$\log(m+n) = \log n + \mathfrak{G}(\log m + \text{arco log } n)$. $\log(m-n) = \log n + \mathfrak{G}^{-1}(\log m + \text{arco log } n)$.
$\log(x+1) = \mathfrak{G}\log x = \log x + \mathfrak{G}\,\text{arco log } x$. $\log(x-1) = \mathfrak{G}^{-1}\log x$. $\log(1-x) = \log x + \mathfrak{G}^{-1}\,\text{arco log } x$.

LOGARITHMIC TRIGONOMETRIC FUNCTIONS.

Angles. m s	′	0° = 0h 00m sin	tan	1° = 0h 04m sin	tan	2° = 0h 08m sin	tan	3° = 0h 12m sin	tan	4° = 0h 16m sin	tan	5° = 0h 20m sin	tan			Angles.	sec 0.00
0 00	00	— ∞		8.2419 19	72	8.5428 31	38	8.7188 94	24	8.8436 46	18	8.9403 20	14	60	4 00	° ′	
04	01	6.4637 37		.2490 91	71	.5464 67	36	.7212 18	24	.8454 65	18	.9417 34	14	59	56	0 52.2	89 07.8
08	02	.7648 48		.2561 62	70	.5500 03	36	.7236 42	24	.8472 83	18	.9432 49	14	58	52	1 30.3	88 29.7
12	03	6.9408 08		.2630 31	69	.5535 38	35	.7260 66	24	.8490 01	18	.9446 63	14	57	48	1 56.6	88 03.4
16	04	7.0658 58		.2699 00	68	.5571 73	35	.7283 90	24	.8508 18	18	.9460 77	14	56	44	2 18.0	87 42.0
0 20	05	7.1627 27		8.2766 67	67	8.5605 08	35	8.7307 13	23	8.8525 36	18	8.9475 92	14	55	3 40	36.5	23.5
24	06	.2419 19		.2832 33	66	.5640 43	34	.7330 37	23	.8543 54	18	.9489 06	14	54	36	2 53.0	87 07.0
28	07	.3088 88		.2898 99	65	.5674 77	34	.7354 60	23	.8560 72	18	.9503 20	14	53	32	3 08.0	86 52.0
32	08	.3668 68		.2962 63	64	.5708 11	34	.7377 83	23	.8578 89	18	.9517 34	14	52	28	22.0	38.0
36	09	.4180 80		.3025 26	63	.5742 45	34	.7400 06	23	.8595 07	17	.9531 49	14	51	24	35.0	25.0
0 40	10	7.4637 37		8.3088 89	62	8.5776 79	33	8.7423 29	23	8.8613 24	17	8.9545 63	14	50	3 20	47.3	12.7
44	11	.5051 51		.3150 50	61	.5809 12	33	.7445 52	23	.8630 42	17	.9559 77	14	49	16	3 59.0	86 01.0
48	12	.5429 29		.3210 11	60	.5842 45	33	.7468 75	23	.8647 59	17	.9573 91	14	48	12	4 10.1	85 49.9
52	13	.5777 77		.3270 71	59	.5875 78	33	.7491 97	23	.8665 76	17	.9587 05	14	47	08	20.7	39.3
56	14	.6099 99		.3329 30	59	.5907 11	32	.7513 20	22	.8682 94	17	.9601 19	14	46	04	30.9	29.1
1 00	15	7.6398 98		8.3388 89	58	8.5939 43	32	8.7535 42	22	8.8699 11	17	8.9614 33	14	45	3 00	40.8	19.2
04	16	.6678 78		.3445 46	57	.5972 75	32	.7557 65	22	.8716 28	17	.9628 46	14	44	56	50.3	09.7
08	17	.6942 42		.3502 03	56	.6003 07	32	.7580 87	22	.8733 45	17	.9642 60	14	43	52	4 59.5	85 00.5
12	18	.7190 90		.3558 59	56	.6035 38	31	.7602 09	22	.8749 62	17	.9655 74	14	42	48	5 08.4	84 51.6
16	19	.7425 25		.3613 14	55	.6066 70	31	.7623 31	22	.8766 78	17	.9669 88	14	41	44	17.1	42.9
1 20	20	7.7648 48		8.3668 69	54	8.6097 01	31	8.7645 52	22	8.8783 95	17	8.9682 01	14	40	2 40	25.5	34.5
24	21	.7859 60		.3722 23	54	.6128 32	31	.7667 74	22	.8799 12	17	.9696 15	14	39	36	33.8	26.2
28	22	.8061 62		.3775 76	53	.6159 63	31	.7688 96	22	.8816 29	17	.9709 29	14	38	32	41.8	18.2
32	23	.8255 55		.3828 29	52	.6189 93	30	.7710 17	21	.8833 45	17	.9723 42	13	37	28	49.6	10.4
36	24	.8439 39		.3880 81	52	.6220 23	30	.7731 39	21	.8849 62	16	.9736 56	13	36	24	5 57.3	84 02.7
1 40	25	7.8617 17		8.3931 32	51	8.6250 54	30	8.7752 60	21	8.8865 78	16	8.9750 69	13	35	2 20	6 04.8	83 55.2
44	26	.8787 87		.3982 83	51	.6279 83	30	.7773 81	21	.8882 95	16	.9763 82	13	34	16	12.2	47.8
48	27	.8951 51		.4032 33	50	.6309 13	30	.7794 02	21	.8898 11	16	.9776 96	13	33	12	19.4	40.6
52	28	.9109 09		.4082 83	49	.6339 43	29	.7815 23	21	.8914 27	16	.9789 09	13	32	08	26.5	33.5
56	29	.9261 61		.4131 32	49	.6368 72	29	.7836 44	21	.8930 44	16	.9803 23	13	31	04	33.4	26.6
2 00	30	7.9408 09		8.4179 81	48	8.6397 01	29	8.7857 65	21	8.8946 60	16	8.9816 36	13	30	2 00	40.2	19.8
04	31	.9551 51		.4227 29	48	.6426 30	29	.7877 86	21	.8962 76	16	.9829 49	13	29	56	46.9	13.1
08	32	.9689 89		.4275 76	47	.6454 59	29	.7898 06	20	.8978 92	16	.9842 62	13	28	52	6 53.5	06.5
12	33	.9822 23	132	.4322 23	47	.6483 87	28	.7918 27	20	.8994 08	16	.9855 75	13	27	48	7 00.0	83 00.0
16	34	7.9952 52	128	.4368 70	46	.6511 15	28	.7939 47	20	.9010 24	16	.9868 88	13	26	44	06.4	82 53.6
2 20	35	8.0078 78	124	8.4414 16	46	8.6539 44	28	8.7959 67	20	8.9026 40	16	8.9881 01	13	25	1 40	12.7	47.3
24	36	.0200 00	121	.4459 61	45	.6567 71	28	.7979 88	20	.9042 56	16	.9894 15	13	24	36	19.0	41.0
28	37	.0319 19	117	.4504 06	45	.6595 99	28	.7999 08	20	.9057 71	16	.9907 28	13	23	32	25.1	34.9
32	38	.0435 35	114	.4549 51	44	.6622 27	27	.8019 28	20	.9073 87	16	.9919 40	13	22	28	31.1	28.9
36	39	.0548 48	111	.4593 95	44	.6650 54	27	.8039 48	20	.9089 03	16	.9932 53	13	21	24	37.1	22.9
2 40	40	8.0658 58	109	8.4637 38	43	8.6677 82	27	8.8059 67	20	8.9104 18	15	8.9945 66	13	20	1 20	43.0	17.0
44	41	.0765 65	106	.4680 82	43	.6704 09	27	.8078 87	20	.9119 34	15	.9958 79	13	19	16	48.8	11.2
48	42	.0870 70	103	.4723 25	43	.6731 36	27	.8098 07	20	.9135 50	15	.9970 92	13	18	12	7 54.5	82 05.5
52	43	.0972 72	101	.4765 67	42	.6758 62	27	.8117 26	19	.9150 65	15	.9983 05	13	17	08	8 00.2	81 59.8
56	44	.1072 72	99	.4807 09	42	.6784 89	26	.8137 46	19	.9166 80	15	.9996 17	13	16	04	05.8	54.2
3 00	45	8.1169 70	97	8.4848 51	41	8.6810 15	26	8.8156 65	19	8.9181 96	15	9.0008 30	13	15	1 00	11.3	48.7
04	46	.1265 65	94	.4890 92	41	.6837 42	26	.8175 85	19	.9196 11	15	.0021 43	13	14	56	16.8	43.2
08	47	.1358 59	92	.4930 33	41	.6863 68	26	.8194 04	19	.9211 26	15	.0033 55	13	13	52	22.2	37.8
12	48	.1450 50	90	.4971 73	40	.6889 94	26	.8213 23	19	.9226 41	15	.0046 68	12	12	48	27.5	32.5
16	49	.1539 40	89	.5011 13	40	.6914 20	26	.8232 42	19	.9241 56	15	.0058 80	12	11	44	32.8	27.2
3 20	50	8.1627 27	87	8.5050 53	39	8.6940 45	26	8.8251 61	19	8.9256 72	15	9.0070 93	12	10	0 40	38.1	21.9
24	51	.1713 13	85	.5090 92	39	.6965 71	25	.8270 80	19	.9271 87	15	.0083 05	12	09	36	43.2	16.8
28	52	.1797 98	84	.5129 31	39	.6991 96	25	.8289 99	19	.9286 02	15	.0095 18	12	08	32	48.4	11.6
32	53	.1880 80	82	.5167 70	38	.7016 21	25	.8307 17	19	.9301 16	15	.0107 30	12	07	28	53.5	06.5
36	54	.1961 62	80	.5206 08	38	.7041 46	25	.8326 36	19	.9315 31	15	.0120 43	12	06	24	8 58.5	81 01.5
3 40	55	8.2041 41	79	8.5243 46	38	8.7066 71	25	8.8345 55	19	8.9330 46	15	9.0132 55	12	05	0 20	9 03.5	80 56.5
44	56	.2119 20	78	.5281 83	37	.7090 96	25	.8363 73	18	.9345 61	15	.0144 67	12	04	16	08.4	51.6
48	57	.2196 96	76	.5318 21	37	.7115 21	25	.8381 92	18	.9359 76	15	.0156 80	12	03	12	13.3	46.7
52	58	.2271 72	75	.5355 58	37	.7140 45	24	.8400 10	18	.9374 90	15	.0168 92	12	02	08	18.2	41.8
56	59	.2346 46	74	.5392 94	37	.7164 70	24	.8418 28	18	.9388 05	15	.0180 04	12	01	04	23.0	37.0
4 00	60	8.2419 19	72	8.5428 31	38	8.7188 94	24	8.8436 46	18	8.9403 20	14	9.0192 16	12	00	0 00	27.8	32.2
		cos	ctn	cos	ctn	cos	ctn	cos	ctn	cos	ctn	cos	ctn			32.5	27.5
		89° = 5h 56m		88° = 5h 52m		87° = 5h 48m		86° = 5h 44m		85° = 5h 40m		84° = 5h 36m		′	m s	37.2	22.8
															Angles.	41.8	18.2
																46.4	13.6
																9 51.0	80 09.0
																° ′	
																Angles.	0.00 csc

LOGARITHMIC TRIGONOMETRIC FUNCTIONS.

	65						60						55						50		
1	6.6	6.5	6.4	6.3	6.2	6.1	6.0	5.9	5.8	5.7	5.6	5.5	5.4	5.3	5.2	5.1	5.0	4.9	4.8	4.7
2	13.2	13.0	12.8	12.6	12.4	12.2	12.0	11.8	11.6	11.4	11.2	11.0	10.8	10.6	10.4	10.2	10.0	9.8	9.6	9.4
3	19.8	19.5	19.2	18.9	18.6	18.3	18.0	17.7	17.4	17.1	16.8	16.5	16.2	15.9	15.6	15.3	15.0	14.7	14.4	14.1
4	26.4	26.0	25.6	25.2	24.8	24.4	24.0	23.6	23.2	22.8	22.4	22.0	21.6	21.2	20.8	20.4	20.0	19.6	19.2	18.8
5	33.0	32.5	32.0	31.5	31.0	30.5	30.0	29.5	29.0	28.5	28.0	27.5	27.0	26.5	26.0	25.5	25.0	24.5	24.0	23.5
6	39.6	39.0	38.4	37.8	37.2	36.6	36.0	35.4	34.8	34.2	33.6	33.0	32.4	31.8	31.2	30.6	30.0	29.4	28.8	28.2
7	46.2	45.5	44.8	44.1	43.4	42.7	42.0	41.3	40.6	39.9	39.2	38.5	37.8	37.1	36.4	35.7	35.0	34.3	33.6	32.9
8	52.8	52.0	51.2	50.4	49.6	48.8	48.0	47.2	46.4	45.6	44.8	44.0	43.2	42.4	41.6	40.8	40.0	39.2	38.4	37.6
9	59.4	58.5	57.6	56.7	55.8	54.9	54.0	53.1	52.2	51.3	50.4	49.5	48.6	47.7	46.8	45.9	45.0	44.1	43.2	42.3

	98							91
1	9.8	9.7	9.6	9.5	9.4	9.3	9.2	9.1
2	19.6	19.4	19.2	19.0	18.8	18.6	18.4	18.2
3	29.4	29.1	28.8	28.5	28.2	27.9	27.6	27.3
4	39.2	38.8	38.4	38.0	37.6	37.2	36.8	36.4
5	49.0	48.5	48.0	47.5	47.0	46.5	46.0	45.5
6	58.8	58.2	57.6	57.0	56.4	55.8	55.2	54.6
7	68.6	67.9	67.2	66.5	65.8	65.1	64.4	63.7
8	78.4	77.6	76.8	76.0	75.2	74.4	73.6	72.8
9	88.2	87.3	86.4	85.5	84.6	83.7	82.8	81.9

	90							83
1	9.0	8.9	8.8	8.7	8.6	8.5	8.4	8.3
2	18.0	17.8	17.6	17.4	17.2	17.0	16.8	16.6
3	27.0	26.7	26.4	26.1	25.8	25.5	25.2	24.9
4	36.0	35.6	35.2	34.8	34.4	34.0	33.6	33.2
5	45.0	44.5	44.0	43.5	43.0	42.5	42.0	41.5
6	54.0	53.4	52.8	52.2	51.6	51.0	50.4	49.8
7	63.0	62.3	61.6	60.9	60.2	59.5	58.8	58.1
8	72.0	71.2	70.4	69.6	68.8	68.0	67.2	66.4
9	81.0	80.1	79.2	78.3	77.4	76.5	75.6	74.7

	82							75
1	8.2	8.1	8.0	7.9	7.8	7.7	7.6	7.5
2	16.4	16.2	16.0	15.8	15.6	15.4	15.2	15.0
3	24.6	24.3	24.0	23.7	23.4	23.1	22.8	22.5
4	32.8	32.4	32.0	31.6	31.2	30.8	30.4	30.0
5	41.0	40.5	40.0	39.5	39.0	38.5	38.0	37.5
6	49.2	48.6	48.0	47.4	46.8	46.2	45.6	45.0
7	57.4	56.7	56.0	55.3	54.6	53.9	53.2	52.5
8	65.6	64.8	64.0	63.2	62.4	61.6	60.8	60.0
9	73.8	72.9	72.0	71.1	70.2	69.3	68.4	67.5

	74							67
1	7.4	7.3	7.2	7.1	7.0	6.9	6.8	6.7
2	14.8	14.6	14.4	14.2	14.0	13.8	13.6	13.4
3	22.2	21.9	21.6	21.3	21.0	20.7	20.4	20.1
4	29.6	29.2	28.8	28.4	28.0	27.6	27.2	26.8
5	37.0	36.5	36.0	35.5	35.0	34.5	34.0	33.5
6	44.4	43.8	43.2	42.6	42.0	41.4	40.8	40.2
7	51.8	51.1	50.4	49.7	49.0	48.3	47.6	46.9
8	59.2	58.4	57.6	56.8	56.0	55.2	54.4	53.6
9	66.6	65.7	64.8	63.9	63.0	62.1	61.2	60.3

Angles.	Names.	0′	10′	20′	30′	40′	50′	60′		Angles.
									10′ = 0 m 40 s	40′ = 2 m 40 s
									20′ = 1 20	50′ = 3 20
									30′ = 2 00	60′ = 4 00
5°	sin	8.9403	545	682	816	945	070	9. 0192	cos	5h 36m
	tan	8.9420	563	701	836	966	093	9. 0216	ctn	
0h 20m	ctn	1.0580	437	299	164	034	907	0. 9784	tan	84°
	cos	9.9983	982	981	980	979	977	9.9976	sin	
	sin	9.0192	311	426	539	648	755	9.0859	cos	
6°	tan	9.0216	336	453	567	678	786	9.0891	ctn	5h 32m
0h 24m	ctn	0.9784	664	547	433	322	214	0.9109	tan	83°
	cos	9.9976	975	973	972	971	969	9.9968	sin	
	sin	9.0859	961	060	157	252	345	9. 1436	cos	
7°	tan	9.0891	995	096	194	291	385	9. 1478	ctn	5h 28m
0h 28m	ctn	0.9109	005	904	806	709	615	0. 8522	tan	82°
	cos	9.9968	966	964	963	961	959	9.9958	sin	
	sin	9.1436	525	612	697	781	863	9.1943	cos	
8°	tan	9.1478	569	658	745	831	915	9.1997	ctn	5h 24m
0h 32m	ctn	0.8522	431	342	255	169	085	0.8003	tan	81°
	cos	9.9958	956	954	952	950	948	9.9946	sin	
	sin	9.1943	022	100	176	251	324	9. 2397	cos	
9°	tan	9.1997	078	158	236	313	389	9. 2463	ctn	5h 20m
0h 36m	ctn	0.8003	922	842	764	687	611	0. 7537	tan	80°
	cos	9.9946	944	942	940	938	936	9.9934	sin	
	sin	9.2397	468	538	606	674	740	9.2806	cos	
10°	tan	9.2463	536	609	680	750	819	9.2887	ctn	5h 16m
0h 40m	ctn	0.7537	464	391	320	250	181	0.7113	tan	79°
	cos	9.9934	931	929	927	924	922	9.9919	sin	
	sin	9.2806	870	934	997	058	119	9. 3179	cos	
11°	tan	9.2887	953	020	085	149	212	9. 3275	ctn	5h 12m
0h 44m	ctn	0.7113	047	980	915	851	788	0. 6725	tan	78°
	cos	9.9919	917	914	912	909	907	9.9904	sin	
	sin	9.3179	238	296	353	410	466	9.3521	cos	
12°	tan	9.3275	336	397	458	517	576	9.3634	ctn	5h 08m
0h 48m	ctn	0.6725	664	603	542	483	424	0.6366	tan	77°
	cos	9.9904	901	899	896	893	890	9.9887	sin	
	sin	9.3521	575	629	682	734	786	9.3837	cos	
13°	tan	9.3634	691	748	804	859	914	9.3968	ctn	5h 04m
0h 52m	ctn	0.6366	309	252	196	141	086	0.6032	tan	76°
	cos	9.9887	884	881	878	875	872	9.9869	sin	
	sin	9.3837	887	937	986	035	083	9. 4130	cos	
14°	tan	9.3968	021	074	127	178	230	9. 4281	ctn	5h 00m
0h 56m	ctn	0.6032	979	926	873	822	770	0. 5719	tan	75°
	cos	9.9869	866	863	859	856	853	9.9849	sin	
1m = 15′ 3m = 45′ 2m = 30′ . 4m = 60′ 1s = 0′.25		60′	50′	40′	30′	20′	10′	0′	Names.	Angles.

LOGARITHMIC TRIGONOMETRIC FUNCTIONS.

	45						40						35						30		
1	4.6	4.5	4.4	4.3	4.2	4.1	4.0	3.9	3.8	3.7	3.6	3.5	3.4	3.3	3.2	3.1	3.0	2.9	2.8	2.7
2	9.2	9.0	8.8	8.6	8.4	8.2	8.0	7.8	7.6	7.4	7.2	7.0	6.8	6.6	6.4	6.2	6.0	5.8	5.6	5.4
3	13.8	13.5	13.2	12.9	12.6	12.3	12.0	11.7	11.4	11.1	10.8	10.5	10.2	9.9	9.6	9.3	9.0	8.7	8.4	8.1
4	18.4	18.0	17.6	17.2	16.8	16.4	16.0	15.6	15.2	14.8	14.4	14.0	13.6	13.2	12.8	12.4	12.0	11.6	11.2	10.6
5	23.0	22.5	22.0	21.5	21.0	20.5	20.0	19.5	19.0	18.5	18.0	17.5	17.0	16.5	16.0	15.5	15.0	14.5	14.0	13.5
6	27.8	27.0	26.4	25.8	25.2	24.6	24.0	23.4	22.8	22.2	21.6	21.0	20.4	19.8	19.2	18.6	18.0	17.4	16.8	16.2
7	32.2	31.5	30.8	30.1	29.4	28.7	28.0	27.3	26.6	25.9	25.2	24.5	23.8	23.1	22.4	21.7	21.0	20.3	19.6	18.9
8	36.8	36.0	35.2	34.4	33.6	32.8	32.0	31.2	30.4	29.6	28.8	28.0	27.2	26.4	25.6	24.8	24.0	23.2	22.4	21.6
9	41.4	40.5	39.6	38.7	37.8	36.9	36.0	35.1	34.2	33.3	32.4	31.5	30.6	29.7	28.8	27.9	27.0	26.1	25.2	24.3

	130							123
1	13.0	12.9	12.8	12.7	12.6	12.5	12.4	12.3
2	26.0	25.8	25.6	25.4	25.2	25.0	24.8	24.6
3	39.0	38.7	38.4	38.1	37.8	37.5	37.2	36.9
4	52.0	51.6	51.2	50.8	50.4	50.0	49.6	49.2
5	65.0	64.5	64.0	63.5	63.0	62.5	62.0	61.5
6	78.0	77.4	76.8	76.2	75.6	75.0	74.4	73.8
7	91.0	90.3	89.6	88.9	88.2	87.5	86.8	86.1
8	104.0	103.2	102.4	101.6	100.8	100.0	99.2	98.4
9	117.0	116.1	115.2	114.3	113.4	112.5	111.6	110.7

	122							115
1	12.2	12.1	12.0	11.9	11.8	11.7	11.6	11.5
2	24.4	24.2	24.0	23.8	23.6	23.4	23.2	23.0
3	36.6	36.3	36.0	35.7	35.4	35.1	34.8	34.5
4	48.8	48.4	48.0	47.6	47.2	46.8	46.4	46.0
5	61.0	60.5	60.0	59.5	59.0	58.5	58.0	57.5
6	73.2	72.6	72.0	71.4	70.8	70.2	69.6	69.0
7	85.4	84.7	84.0	83.3	82.6	81.9	81.2	80.5
8	97.6	96.8	96.0	95.2	94.4	93.6	92.8	92.0
9	109.8	108.9	108.0	107.1	106.2	105.3	104.4	103.5

	114							107
1	11.4	11.3	11.2	11.1	11.0	10.9	10.8	10.7
2	22.8	22.6	22.4	22.2	22.0	21.8	21.6	21.4
3	34.2	33.9	33.6	33.3	33.0	32.7	32.4	32.1
4	45.6	45.2	44.8	44.4	44.0	43.6	43.2	42.8
5	57.0	56.5	56.0	55.5	55.0	54.5	54.0	53.5
6	68.4	67.8	67.2	66.6	66.0	65.4	64.8	64.2
7	79.8	79.1	78.4	77.7	77.0	76.3	75.6	74.9
8	91.2	90.4	89.6	88.8	88.0	87.2	86.4	85.6
9	102.6	101.7	100.8	99.9	99.0	98.1	97.2	96.3

	106							99
1	10.6	10.5	10.4	10.3	10.2	10.1	10.0	9.9
2	21.2	21.0	20.8	20.6	20.4	20.2	20.0	19.8
3	31.8	31.5	31.2	30.9	30.6	30.3	30.0	29.7
4	42.4	42.0	41.6	41.2	40.8	40.4	40.0	39.6
5	53.0	52.5	52.0	51.5	51.0	50.5	50.0	49.5
6	63.6	63.0	62.4	61.8	61.2	60.6	60.0	59.4
7	74.2	73.5	72.8	72.1	71.4	70.7	70.0	69.3
8	84.8	84.0	83.2	82.4	81.6	80.8	80.0	79.2
9	95.4	94.5	93.6	92.7	91.8	90.9	90.0	89.1

Angles.	Names.	0′	10′	20′	30′	40′	50′	60′	Names.	Angles.
	sin	9.4130	177	223	269	314	359	9.4403	cos	
15°	tan	9.4281	331	381	430	479	527	9.4575	ctn	4h 56m
1h 00m	ctn	0.5719	669	619	570	521	473	0.5425	tan	74°
	cos	9.9849	846	843	839	836	832	9.9828	sin	
	sin	9.4403	447	491	533	576	618	9.4659	cos	
16°	tan	9.4575	622	669	716	762	808	9.4853	ctn	4h 52m
1h 04m	ctn	0.5425	378	331	284	238	192	0.5147	tan	73°
	cos	9.9828	825	821	817	814	810	9.9806	sin	
	sin	9.4659	700	741	781	821	861	9.4900	cos	
17°	tan	9.4853	898	943	987	031	075	9.5118	ctn	4h 48m
1h 08m	ctn	0.5147	102	057	013	969	925	0.4882	tan	72°
	cos	9.9806	802	798	794	790	786	9.9782	sin	
	sin	9.4900	939	977	015	052	090	9.5126	cos	
18°	tan	9.5118	161	203	245	287	329	9.5370	ctn	4h 44m
1h 12m	ctn	0.4882	839	797	755	713	671	0.4630	tan	71°
	cos	9.9782	778	774	770	765	761	9.9757	sin	
	sin	9.5126	163	199	235	270	306	9.5341	cos	
19°	tan	9.5370	411	451	491	531	571	9.5611	ctn	4h 40m
1h 16m	ctn	0.4630	589	549	509	469	429	0.4389	tan	70°
	cos	9.9757	752	748	743	739	734	9.9730	sin	
	sin	9.5341	375	409	443	477	510	9.5543	cos	
20°	tan	9.5611	650	689	727	766	804	9.5842	ctn	4h 36m
1h 20m	ctn	0.4389	350	311	273	234	196	0.4158	tan	69°
	cos	9.9730	725	721	716	711	706	9.9702	sin	
	sin	9.5543	576	609	641	673	704	9.5736	cos	
21°	tan	9.5842	879	917	954	991	028	9.6064	ctn	4h 32m
1h 24m	ctn	0.4158	121	083	046	009	972	0.3936	tan	68°
	cos	9.9702	697	692	687	682	677	9.9672	sin	
	sin	9.5736	767	798	828	859	889	9.5919	cos	
22°	tan	9.6064	100	136	172	208	243	9.6279	ctn	4h 28m
1h 28m	ctn	0.3936	900	864	828	792	757	0.3721	tan	67°
	cos	9.9672	667	661	656	651	646	9.9640	sin	
	sin	9.5919	948	978	007	036	065	9.6093	cos	
23°	tan	9.6279	314	348	383	417	452	9.6486	ctn	4h 24m
1h 32m	ctn	0.3721	686	652	617	583	548	0.3514	tan	66°
	cos	9.9640	635	629	624	618	613	9.9607	sin	
	sin	9.6093	121	149	177	205	232	9.6259	cos	
24°	tan	9.6486	520	553	587	620	654	9.6687	ctn	4h 20m
1h 36m	ctn	0.3514	480	447	413	380	346	0.3313	tan	65°
	cos	9.9607	602	596	590	584	579	9.9573	sin	
1m=15′ 3m=45′ 2m=30′ 4m=60′ 1″=0′.25		60′	50′	40′	30′	20′	10′	0′	Names.	Angles.

′	m s	′	m s
10	0 40	40	2 40
20	1 20	50	3 20
30	2 00	60	4 00

LOGARITHMIC TRIGONOMETRIC FUNCTIONS.

Angles in All Quadrants.

Names.	$-\varphi$	$0°$	φ	$90°-\varphi$	$90°$	$90°+\varphi$	$180°-\varphi$	$180°$	$180°+\varphi$	$270°-\varphi$	$270°$	$270°+\varphi$	$360°-\varphi$	$360°$	$360°+\varphi$	
sin	$-\sin\varphi$	∓ 0	$+\sin\varphi$	$+\cos\varphi$	$+1$	$+\cos\varphi$	$+\sin\varphi$	± 0	$-\sin\varphi$	$-\cos\varphi$	-1	$-\cos\varphi$	$-\sin\varphi$	∓ 0	$+\sin\varphi$	cos
csc	$-\csc\varphi$	$\mp\infty$	$+\csc\varphi$	$+\sec\varphi$	$+1$	$+\sec\varphi$	$+\csc\varphi$	$\pm\infty$	$-\csc\varphi$	$-\sec\varphi$	-1	$-\sec\varphi$	$-\csc\varphi$	$\mp\infty$	$+\csc\varphi$	sec
tan	$-\tan\varphi$	∓ 0	$+\tan\varphi$	$+\operatorname{ctn}\varphi$	$\pm\infty$	$-\operatorname{ctn}\varphi$	$-\tan\varphi$	∓ 0	$+\tan\varphi$	$+\operatorname{ctn}\varphi$	$\pm\infty$	$-\operatorname{ctn}\varphi$	$-\tan\varphi$	∓ 0	$+\tan\varphi$	ctn
ctn	$-\operatorname{ctn}\varphi$	$\mp\infty$	$+\operatorname{ctn}\varphi$	$+\tan\varphi$	± 0	$-\tan\varphi$	$-\operatorname{ctn}\varphi$	$\mp\infty$	$+\operatorname{ctn}\varphi$	$+\tan\varphi$	± 0	$-\tan\varphi$	$-\operatorname{ctn}\varphi$	$\mp\infty$	$+\operatorname{ctn}\varphi$	tan
sec	$+\sec\varphi$	$+1$	$+\sec\varphi$	$+\csc\varphi$	$\pm\infty$	$-\csc\varphi$	$-\sec\varphi$	-1	$-\sec\varphi$	$-\csc\varphi$	$\mp\infty$	$+\csc\varphi$	$+\sec\varphi$	$+1$	$+\sec\varphi$	csc
cos	$+\cos\varphi$	$+1$	$+\cos\varphi$	$+\sin\varphi$	± 0	$-\sin\varphi$	$-\cos\varphi$	-1	$-\cos\varphi$	$-\sin\varphi$	∓ 0	$+\sin\varphi$	$+\cos\varphi$	$+1$	$+\cos\varphi$	sin
	$810°+\varphi$	$810°$	$810°-\varphi$	$720°+\varphi$	$720°$	$720°-\varphi$	$630°+\varphi$	$630°$	$630°-\varphi$	$540°+\varphi$	$540°$	$540°-\varphi$	$450°+\varphi$	$450°$	$450°-\varphi$	Names.

Angles in All Quadrants.

Angles.	Names.	0′	10′	20′	30′	40′	50′	60′	Names.	Angles.
	sin	9.6259	286	313	340	366	392	9.6418	cos	
25°	tan	9.6687	720	752	785	817	850	9.6882	ctn	$4^h\ 16^m$
$1^h\ 40^m$	ctn	0.3313	280	248	215	183	150	0.3118	tan	64°
	cos	9.9573	567	561	555	549	543	9.9537	sin	
	sin	9.6418	444	470	495	521	546	9.6570	cos	
26°	tan	9.6882	914	946	977	009	040	9.7072	ctn	$4^h\ 12^m$
$1^h\ 44^m$	ctn	0.3118	086	054	023	991	960	0.2928	tan	63°
	cos	9.9537	530	524	518	512	505	9.9499	sin	
	sin	9.6570	595	620	644	668	692	9.6716	cos	
27°	tan	9.7072	103	134	165	196	226	9.7257	ctn	$4^h\ 08^m$
$1^h\ 48^m$	ctn	0.2928	897	866	835	804	774	0.2743	tan	62°
	cos	9.9499	492	486	479	473	466	9.9459	sin	
	sin	9.6716	740	763	787	810	833	9.6856	cos	
28°	tan	9.7257	287	317	348	378	408	9.7438	ctn	$4^h\ 04^m$
$1^h\ 52^m$	ctn	0.2743	713	683	652	622	592	0.2562	tan	61°
	cos	9.9459	453	446	439	432	425	9.9418	sin	
	sin	9.6856	878	901	923	946	968	9.6990	cos	
29°	tan	9.7438	467	497	526	556	585	9.7614	ctn	$4^h\ 00^m$
$1^h\ 56^m$	ctn	0.2562	533	503	474	444	415	0.2386	tan	60°
	cos	9.9418	411	404	397	390	383	9.9375	sin	
	sin	9.6990	012	033	055	076	097	9.7118	cos	
30°	tan	9.7614	644	673	701	730	759	9.7788	ctn	$3^h\ 56^m$
$2^h\ 00^m$	ctn	0.2386	356	327	299	270	241	0.2212	tan	59°
	cos	9.9375	368	361	353	346	338	9.9331	sin	
	sin	9.7118	139	160	181	201	222	9.7242	cos	
31°	tan	9.7788	816	845	873	902	930	9.7958	ctn	$3^h\ 52^m$
$2^h\ 04^m$	ctn	0.2212	184	155	127	098	070	0.2042	tan	58°
	cos	9.9331	323	315	308	300	292	9.9284	sin	
	sin	9.7242	262	282	302	322	342	9.7361	cos	
32°	tan	9.7958	986	014	042	070	097	9.8125	ctn	$3^h\ 48^m$
$2^h\ 08^m$	ctn	0.2042	014	986	958	930	903	0.1875	tan	57°
	cos	9.9284	276	268	260	252	244	9.9236	sin	
	sin	9.7361	380	400	419	438	457	9.7476	cos	
33°	tan	9.8125	153	180	208	235	263	9.8290	ctn	$3^h\ 44^m$
$2^h\ 12^m$	ctn	0.1875	847	820	792	765	737	0.1710	tan	56°
	cos	9.9236	228	219	211	203	194	9.9186	sin	
	sin	9.7476	494	513	531	550	568	9.7586	cos	
34°	tan	9.8290	317	344	371	398	425	9.8452	ctn	$3^h\ 40^m$
$2^h\ 16^m$	ctn	0.1710	683	656	629	602	575	0.1548	tan	55°
	cos	9.9186	177	169	160	151	142	9.9134	sin	
$1^m=15'$ $3^m=45'$ $2^m=30'$ $4^m=60'$ $1^s=0'.25$		60′	50′	40′	30′	20′	10′	0′		

′ m s: 10=0 40, 20=1 20, 30=2 00, 40=2 40, 50=3 20, 60=4 00

Proportional Parts.

1	2	3	4	5	6	7	8	9
2.6	5.3	7.9	10.6	13.2	15.9	18.5	21.2	23.8
3.3	6.5	9.8	13.0	16.3	19.5	22.8	26.0	29.3
0.6	1.2	1.8	2.4	3.0	3.6	4.2	4.8	5.4
2.5	5.1	7.6	10.1	12.7	15.2	17.7	20.3	22.8
3.2	6.3	9.5	12.7	15.8	19.0	22.1	25.3	28.5
0.6	1.3	1.9	2.5	3.1	3.8	4.4	5.0	5.7
2.4	4.9	7.3	9.7	12.1	14.6	17.0	19.4	21.8
3.1	6.2	9.3	12.3	15.4	18.6	21.6	24.7	27.8
0.7	1.3	2.0	2.6	3.3	3.9	4.6	5.3	5.9
2.3	4.7	7.0	9.3	11.6	14.0	16.3	18.6	20.9
3.0	6.0	9.0	12.1	15.1	18.1	21.1	24.1	27.1
0.7	1.4	2.1	2.7	3.4	4.1	4.8	5.5	6.2
2.2	4.5	6.7	8.9	11.2	13.4	15.6	17.9	20.1
2.9	5.9	8.8	11.8	14.7	17.7	20.6	23.6	26.5
0.7	1.4	2.1	2.9	3.6	4.3	5.0	5.7	6.4
2.1	4.3	6.4	8.6	10.7	12.9	15.0	17.2	19.3
2.9	5.8	8.7	11.6	14.4	17.3	20.2	23.1	26.0
0.7	1.5	2.2	3.0	3.7	4.5	5.2	6.0	6.7
2.1	4.1	6.2	8.2	10.3	12.4	14.4	16.5	18.6
2.8	5.7	8.5	11.3	14.2	17.0	19.9	22.7	25.5
0.8	1.5	2.3	3.1	3.9	4.6	5.4	6.2	7.0
2.0	4.0	5.9	7.9	9.9	11.9	13.9	15.9	17.8
2.8	5.6	8.4	11.2	13.9	16.7	19.5	22.3	25.1
0.9	1.6	2.4	3.2	4.0	4.8	5.6	6.4	7.2
1.9	3.8	5.7	7.6	9.5	11.5	13.4	15.3	17.2
2.7	5.5	8.2	11.0	13.7	16.5	19.2	22.0	24.7
0.8	1.7	2.5	3.3	4.2	5.0	5.9	6.7	7.5
1.8	3.7	5.5	7.4	9.2	11.0	12.9	14.7	16.5
2.7	5.4	8.1	10.8	13.6	16.2	18.9	21.7	24.4
0.9	1.7	2.6	3.5	4.3	5.2	6.1	6.9	7.8
1	2	3	4	5	6	7	8	9

Proportional Parts.

LOGARITHMIC TRIGONOMETRIC FUNCTIONS.

Points of the Compass.

Names.	0¼	0½	0¾	1	1¼	1½	1¾	2	2¼	2½	2¾	3	3¼	3½	3¾	4	
sin	8.6908	8.9913	9.1665	9.2902	9.3856	9.4628	9.5275	9.5828	9.6310	9.6734	9.7110	9.7447	9.7750	9.8024	9.8271	9.8495	cos
csc	1.3092	1.0087	0.8335	0.7098	0.6114	0.5372	0.4725	0.4172	0.3690	0.3266	0.2890	0.2553	0.2250	0.1976	0.1729	0.1505	sec
tan	8.6913	8.9934	9.1712	9.2987	9.3988	9.4619	9.5536	9.6172	9.6748	9.7280	9.7777	9.8249	9.8702	9.9142	9.9573	0.0000	ctn
ctn	1.3087	1.0066	0.8288	0.7013	0.6012	0.5181	0.4464	0.3828	0.3252	0.2720	0.2223	0.1751	0.1298	0.0858	0.0427	0.0000	tan
sec	0.0005	0.0021	0.0047	0.0084	0.0132	0.0191	0.0262	0.0344	0.0438	0.0546	0.0667	0.0802	0.0952	0.1118	0.1302	0.1505	csc
cos	9.9995	9.9979	9.9953	9.9916	9.9868	9.9809	9.9738	9.9656	9.9562	9.9454	9.9333	9.9198	9.9048	9.8882	9.8698	9.8495	sin
	7¾	7½	7¼	7	6¾	6½	6¼	6	5¾	5½	5¼	5	4¾	4½	4¼	4	Names.

Points of the Compass.

Angles.	Names.	0′	10′	20′	30′	40′	50′	60′		Proportional Parts. 1	2	3	4	5	6	7	8	9
										10′=0 m 40 s			40′=2 m 40 s					
										20′=1 20			50′=3 20					
										30′=2 00			60′=4 00					
35°	sin	9.7586	604	622	640	657	675	9.7692	cos									
	tan	9.8452	479	506	533	559	586	9.8613	ctn	3h 36m								
2h 20m	ctn	0.1548	521	494	467	441	414	0.1387	tan	54°								
	cos	9.9134	125	116	107	098	089	9.9080	sin									
	sin	9.7692	710	727	744	761	778	9.7795	cos									
36°	tan	9.8613	639	666	692	718	745	9.8771	ctn	3h 32m								
2h 24m	ctn	0.1387	361	334	308	282	255	0.1229	tan	53°								
	cos	9.9080	070	061	052	042	033	9.9023	sin									
	sin	9.7795	811	828	844	861	877	9.7893	cos									
37°	tan	9.8771	797	824	850	876	902	9.8928	ctn	3h 28m								
2h 28m	ctn	0.1229	203	176	150	124	098	0.1072	tan	52°								
	cos	9.9023	014	004	995	985	975	9. 9965	sin									
	sin	9.7893	910	926	941	957	973	9.7989	cos									
38°	tan	9.8928	954	980	006	032	058	9. 9084	ctn	3h 24m								
2h 32m	ctn	0.1072	046	020	994	968	942	0. 0916	tan	51°								
	cos	9.8965	955	945	935	925	915	9.8905	sin									
	sin	9.7989	004	020	035	050	066	9. 9081	cos									
39°	tan	9.9084	110	135	161	187	212	9.9238	ctn	3h 20m								
2h 36m	ctn	0.0916	890	865	839	813	788	0.0762	tan	50°								
	cos	9.8905	895	884	874	864	853	9.8843	sin									
	sin	9.8081	096	111	125	140	155	9.8169	cos									
40°	tan	9.9238	264	289	315	341	366	9.9392	ctn	3h 16m								
2h 40m	ctn	0.0762	736	711	685	659	634	0.0608	tan	49°								
	cos	9.8843	832	821	810	800	789	9.8778	sin									
	sin	9.8169	184	198	213	227	241	9.8255	cos									
41°	tan	9.9392	417	443	468	494	519	9.9544	ctn	3h 12m								
2h 44m	ctn	0.0608	583	557	532	506	481	0.0456	tan	48°								
	cos	9.8778	767	756	745	733	722	9.8711	sin									
	sin	9.8255	269	283	297	311	324	9.8338	cos									
42°	tan	9.9544	570	595	621	646	671	9.9697	ctn	3h 08m								
2h 48m	ctn	0.0456	430	405	379	354	329	0.0303	tan	47°								
	cos	9.8711	699	688	676	665	653	9.8641	sin									
	sin	9.8338	351	365	378	391	405	9.8418	cos									
43°	tan	9.9697	722	747	772	798	823	9.9848	ctn	3h 04m								
2h 52m	ctn	0.0303	278	253	228	202	177	0.0152	tan	46°								
	cos	9.8641	629	618	606	594	582	9.8569	sin									
	sin	9.8418	431	444	457	469	482	9.8495	cos									
44°	tan	9.9848	874	899	924	949	975	0. 0000	ctn	3h 00m								
2h 56m	ctn	0.0152	126	101	076	051	025	0.0000	tan	45°								
	cos	9.8569	557	545	532	520	507	9.8495	sin									
1m=15′ 3m=45′		60′	50′	40′	30′	20′	10′	0′	Names.	Angles.	1	2	3	4	5	6	7	8	9
2m=30′ 4m=60′											Proportional Parts.								
1s=0′.25																			

INVERSE TRIGONOMETRIC FUNCTIONS.

$\log A$	$\sin^{-1}A$		$\cos^{-1}A$	$\tan^{-1}A$		$\operatorname{ctn}^{-1}A$	
8.50	1 48.7	0.25	88 11.3	1 48.7	0.25	88 11.3	**1.50**
.51	1 51.3	0.26	88 08.7	1 51.2	0.26	88 08.8	**.49**
.52	1 53.9	0.26	88 06.1	1 53.8	0.26	88 06.2	**.48**
.53	1 56.5	0.27	88 03.5	1 56.4	0.27	88 03.6	**.47**
.54	1 59.2	0.27	88 00.8	1 59.2	0.27	88 00.8	**.46**
8.55	2 02.0	0.28	87 58.0	2 01.9	0.28	87 58.1	**1.45**
.56	2 04.8	0.29	87 55.2	2 04.8	0.29	87 55.2	**.44**
.57	2 07.8	0.29	87 52.2	2 07.7	0.29	87 52.3	**.43**
.58	2 10.7	0.30	87 49.3	2 10.6	0.30	87 49.4	**.42**
.59	2 13.8	0.31	87 46.2	2 13.7	0.31	87 46.3	**.41**
8.60	2 16.9	0.32	87 43.1	2 16.8	0.31	87 43.2	**1.40**
.61	2 20.1	0.32	87 39.9	2 20.0	0.32	87 40.0	**.39**
.62	2 23.4	0.33	87 36.6	2 23.2	0.33	87 36.8	**.38**
.63	2 26.7	0.34	87 33.3	2 26.6	0.34	87 33.4	**.37**
.64	2 30.1	0.35	87 29.9	2 30.0	0.34	87 30.0	**.36**
8.65	2 33.6	0.35	87 26.4	2 33.5	0.35	87 26.5	**1.35**
.66	2 37.2	0.36	87 22.8	2 37.0	0.36	87 23.0	**.34**
.67	2 40.9	0.37	87 19.1	2 40.7	0.37	87 19.3	**.33**
.68	2 44.6	0.38	87 15.4	2 44.4	0.38	87 15.6	**.32**
.69	2 48.4	0.39	87 11.6	2 48.2	0.39	87 11.8	**.31**
8.70	2 52.4	0.40	87 07.6	2 52.2	0.40	87 07.8	**1.30**
.71	2 56.4	0.41	87 03.6	2 56.2	0.40	87 03.8	**.29**
.72	3 00.5	0.42	86 59.5	3 00.3	0.41	86 59.7	**.28**
.73	3 04.7	0.43	86 55.3	3 04.4	0.42	86 55.6	**.27**
.74	3 09.0	0.44	86 51.0	3 08.7	0.43	86 51.3	**.26**
8.75	3 13.4	0.45	86 46.6	3 13.1	0.44	86 46.9	**1.25**
.76	3 17.9	0.46	86 42.1	3 17.6	0.45	86 42.4	**.24**
.77	3 22.5	0.47	86 37.5	3 22.2	0.46	86 37.8	**.23**
.78	3 27.3	0.48	86 32.7	3 26.9	0.48	86 33.1	**.22**
.79	3 32.1	0.49	86 27.9	3 31.7	0.49	86 28.3	**.21**
8.80	3 37.1	0.50	86 22.9	3 36.6	0.50	86 23.4	**1.20**
.81	3 42.1	0.51	86 17.9	3 41.7	0.51	86 18.3	**.19**
.82	3 47.3	0.52	86 12.7	3 46.8	0.52	86 13.2	**.18**
.83	3 52.6	0.54	86 07.4	3 52.1	0.63	86 07.9	**.17**
.84	3 58.0	0.55	86 02.0	3 57.5	0.55	86 02.5	**.16**
8.85	4 03.6	0.56	85 56.4	4 03.0	0.56	85 57.0	**1.15**
.86	4 09.3	0.57	85 50.7	4 08.6	0.57	85 51.4	**.14**
.87	4 15.1	0.59	85 44.9	4 14.4	0.58	85 45.6	**.13**
.88	4 21.0	0.60	85 39.0	4 20.3	0.60	85 39.7	**.12**
.89	4 27.1	0.62	85 32.9	4 26.3	0.61	85 33.7	**.11**
8.90	4 33.4	0.63	85 26.6	4 32.5	0.62	85 27.5	**1.10**
.91	4 39.7	0.65	85 20.3	4 38.8	0.61	85 21.2	**.09**
.92	4 46.3	0.66	85 13.7	4 45.3	0.65	85 14.7	**.08**
.93	4 53.0	0.68	85 07.0	4 51.9	0.67	85 08.1	**.07**
.94	4 59.8	0.69	85 00.2	4 58.7	0.68	85 01.3	**.06**
8.95	5 06.8	0.71	84 53.2	5 05.6	0.70	84 54.4	**1.05**
.96	5 14.0	0.72	84 46.0	5 12.7	0.72	84 47.3	**.04**
.97	5 21.3	0.74	84 38.7	5 19.9	0.73	84 40.1	**.03**
.98	5 28.8	0.76	84 31.2	5 27.3	0.75	84 32.7	**.02**
.99	5 36.5	0.78	84 23.5	5 34.9	0.77	84 25.1	**.01**
9.00	5 44.4	0.80	84 15.6	5 42.6	0.78	84 17.4	**1.00**
	$\csc^{-1}A$		$\sec^{-1}A$	$\operatorname{ctn}^{-1}A$		$\tan^{-1}A$	$\log A$

If $\log A < 8.5000$, φ (in minutes) $= \sin^{-1}A = \tan^{-1}A = \log^{-1}(\log A + 3.5363 - 10)$.

$\log A$	$\sin^{-1}A$		$\cos^{-1}A$	$\tan^{-1}A$		$\operatorname{ctn}^{-1}A$	
9.00	5 44	0.8	84 16	5 43	0.8	84 17	**1.00**
.01	5 52	0.8	84 08	5 51	0.8	84 09	**0.99**
.02	6 01	0.8	83 59	5 59	0.8	84 01	**.98**
.03	6 09	0.9	83 51	6 07	0.8	83 53	**.97**
.04	6 18	0.9	83 42	6 15	0.9	83 45	**.96**
9.05	6 27	0.9	83 33	6 24	0.9	83 36	**0.95**
.06	6 36	0.9	83 24	6 33	0.9	83 27	**.94**
.07	6 45	0.9	83 15	6 42	0.9	83 18	**.93**
.08	6 54	1.0	83 06	6 51	0.9	83 09	**.92**
.09	7 04	1.0	82 56	7 01	1.0	82 59	**.91**
9.10	7 14	1.0	82 46	7 11	1.0	82 49	**0.90**
.11	7 24	1.0	82 36	7 20	1.0	82 40	**.89**
.12	7 35	1.1	82 25	7 31	1.0	82 29	**.88**
.13	7 45	1.1	82 15	7 41	1.0	82 19	**.87**
.14	7 56	1.1	82 04	7 52	1.1	82 08	**.86**
9.15	8 07	1.1	81 53	8 02	1.1	81 58	**0.85**
.16	8 19	1.2	81 41	8 13	1.1	81 47	**.84**
.17	8 30	1.2	81 30	8 25	1.1	81 35	**.83**
.18	8 42	1.2	81 18	8 36	1.2	81 24	**.82**
.19	8 55	1.2	81 05	8 48	1.2	81 12	**.81**
9.20	9 07	1.3	80 53	9 00	1.2	81 00	**0.80**
.21	9 20	1.3	80 40	9 13	1.3	80 47	**.79**
.22	9 33	1.3	80 27	9 25	1.3	80 35	**.78**
.23	9 47	1.4	80 13	9 38	1.3	80 22	**.77**
.24	10 00	1.4	80 00	9 52	1.3	80 08	**.76**
9.25	10 15	1.4	79 45	10 05	1.4	79 55	**0.75**
.26	10 29	1.5	79 31	10 19	1.4	79 41	**.74**
.27	10 44	1.5	79 16	10 33	1.4	79 27	**.73**
.28	10 59	1.5	79 01	10 47	1.5	79 13	**.72**
.29	11 15	1.6	78 45	11 02	1.5	78 58	**.71**
9.30	11 31	1.6	78 29	11 17	1.5	78 43	**0.70**
.31	11 47	1.7	78 13	11 32	1.6	78 28	**.69**
.32	12 04	1.7	77 56	11 48	1.6	78 12	**.68**
.33	12 21	1.7	77 39	12 04	1.6	77 56	**.67**
.34	12 38	1.8	77 22	12 20	1.7	77 40	**.66**
9.35	12 56	1.8	77 04	12 37	1.7	77 23	**0.65**
.36	13 15	1.9	76 45	12 54	1.7	77 06	**.64**
.37	13 33	1.9	76 27	13 12	1.8	76 48	**.63**
.38	13 53	2.0	76 07	13 29	1.8	76 31	**.62**
.39	14 13	2.0	75 47	13 48	1.8	76 12	**.61**
9.40	14 33	2.1	75 27	14 06	1.9	75 54	**0.60**
.41	14 54	2.1	75 06	14 25	1.9	75 35	**.59**
.42	15 15	2.2	74 45	14 44	1.9	75 16	**.58**
.43	15 37	2.2	74 23	15 04	2.0	74 56	**.57**
.44	15 59	2.3	74 01	15 24	2.0	74 36	**.56**
9.45	16 22	2.3	73 38	15 44	2.1	74 16	**0.55**
.46	16 46	2.4	73 14	16 05	2.1	73 55	**.54**
.47	17 10	2.4	72 50	16 27	2.1	73 33	**.53**
.48	17 35	2.5	72 25	16 48	2.2	73 12	**.52**
.49	18 00	2.6	72 00	17 10	2.2	72 50	**.51**
9.50	18 26	2.6	71 34	17 33	2.3	72 27	**0.50**
	$\csc^{-1}A$		$\sec^{-1}A$	$\operatorname{ctn}^{-1}A$		$\tan^{-1}A$	$\log A$

INVERSE TRIGONOMETRIC FUNCTIONS.

log A	$\sin^{-1}A$		$\cos^{-1}A$	$\tan^{-1}A$		$\operatorname{ctn}^{-1}A$	
	° ′	′	° ′	° ′	′	° ′	
9.50	18 26	2.6	71 34	17 33	2.3	72 27	0.50
.51	18 53	2.7	71 07	17 56	2.3	72 04	.49
.52	19 20	2.8	70 40	18 19	2.4	71 41	.48
.53	19 48	2.9	70 12	18 43	2.4	71 17	.47
.54	20 17	2.9	69 43	19 07	2.5	70 53	.46
9.55	20 47	3.0	69 13	19 32	2.5	70 28	0.45
.56	21 17	3.1	68 43	19 57	2.5	70 03	.44
.57	21 49	3.2	68 11	20 23	2.6	69 37	.43
.58	22 21	3.3	67 39	20 49	2.6	69 11	.42
.59	22 54	3.3	67 06	21 15	2.7	68 45	.41
9.60	23 28	3.4	66 32	21 42	2.7	68 18	0.40
.61	24 02	3.5	65 58	22 10	2.8	67 50	.39
.62	24 38	3.6	65 22	22 38	2.8	67 22	.38
.63	25 15	3.7	64 45	23 06	2.9	66 54	.37
.64	25 53	3.8	64 07	23 35	2.9	66 25	.36
9.65	26 32	4.0	63 28	24 04	2.9	65 56	0.35
.66	27 12	4.1	62 48	24 34	3.0	65 26	.34
.67	27 53	4.2	62 07	25 04	3.0	64 56	.33
.68	28 36	4.3	61 24	25 35	3.1	64 25	.32
.69	29 20	4.4	60 40	26 06	3.1	63 54	.31
9.70	30 05	4.6	59 55	26 37	3.2	63 23	0.30
.71	30 51	4.7	59 09	27 09	3.2	62 51	.29
.72	31 39	4.9	58 21	27 41	3.3	62 19	.28
.73	32 29	5.0	57 31	28 14	3.3	61 46	.27
.74	33 20	5.2	56 40	28 47	3.3	61 13	.26
9.75	34 13	5.4	55 47	29 21	3.4	60 39	0.25
.76	35 08		54 52	29 55	3.4	60 05	.24
.77	36 04		53 56	30 29	3.5	59 31	.23
.78	37 03		52 57	31 04	3.5	58 56	.22
.79	38 04		51 56	31 39	3.5	58 21	.21
9.80	39 07		50 53	32 15	3.6	57 45	0.20
.81	40 13		49 47	32 51	3.6	57 09	.19
.82	41 21		48 39	33 27	3.6	56 33	.18
.83	42 32		47 28	34 04	3.7	55 56	.17
.84	43 47		46 13	34 41	3.7	55 19	.16
9.85	45 04		44 56	35 18	3.7	54 42	0.15
.86	46 25		43 35	35 55	3.8	54 05	.14
.87	47 51		42 09	36 33	3.8	53 27	.13
.88	49 20		40 40	37 11	3.8	52 49	.12
.89	50 55		39 05	37 49	3.8	52 11	.11
9.90	52 36		37 24	38 28	3.9	51 32	0.10
.91	54 22		35 38	39 06	3.9	50 54	.09
.92	56 17		33 43	39 45	3.9	50 15	.08
.93	58 20		31 40	40 24	3.9	49 36	.07
.94	60 34		29 26	41 03	3.9	48 57	.06
9.95	63 02		26 58	41 43	3.9	48 17	0.05
.96	65 47		24 13	42 22	3.9	47 38	.04
.97	68 57		21 03	43 01	3.9	46 59	.03
.98	72 45		17 15	43 41	4.0	46 19	.02
.99	77 45		12 15	44 20	4.0	45 40	.01
0.00	90 00		0 00	45 00	4.0	45 00	0.00
	° ′	′	° ′	° ′	′	° ′	
	$\csc^{-1}A$		$\sec^{-1}A$	$\operatorname{ctn}^{-1}A$		$\tan^{-1}A$	$\log A$

log A	$\sin^{-1}A$		log A	$\sin^{-1}A$		log A	$\sin^{-1}A$		log A	$\sin^{-1}A$	
	° ′	′		° ′	′		° ′	′		° ′	′
9.750	34 13	5.4	9.900	52 36	10	9.950	63 02	16	9.990	77 45	36
.755	34 40	5.5	.901	52 46	10	.951	63 17	16	.991	78 23	38
.760	35 08	5.6	.902	52 56	10	.952	63 33	16	.992	79 02	41
.765	35 36	5.7	.903	53 07	11	.953	63 49	16	.993	79 44	44
.770	36 04	5.8	.904	53 17	11	.954	64 06	16	.994	80 30	47
9.775	36 34	5.9	9.905	53 28	11	9.955	64 22	16	.995	81 19	
.780	37 03	6.0	.906	53 39	11	.956	64 39	17	.996	82 14	
.785	37 33	6.1	.907	53 50	11	.957	64 55	17	.997	83 16	
.790	38 04	6.2	.908	54 00	11	.958	65 12	17	.998	84 30	
.795	38 35	6.3	.909	54 11	11	.959	65 30	17	.999	86 07	
9.800	39 07	6.4	9.910	54 22	11	9.960	65 47	18	0.000	90 00	
.805	39 40	6.6	.911	54 33	11	.961	66 05	18		° ′	′
.810	40 13	6.7	.912	54 45	11	.962	66 23	18			
.815	40 47	6.8	.913	54 56	11	.963	66 41	18			
.820	41 21	7.0	.914	55 07	11	.964	67 00	19			
9.825	41 56	7.1	9.915	55 19	11	9.965	67 18	19			
.830	42 32	7.3	.916	55 30	12	.966	67 37	19			
.835	43 09	7.4	.917	55 42	12	.967	67 57	20			
.840	43 47	7.6	.918	55 53	12	.968	68 16	20			
.845	44 25	7.8	.919	56 05	12	.969	68 36	20			
9.850	45 04	7.9	9.920	56 17	12	9.970	68 57	21			
.852	45 20	8.0	.921	56 29	12	.971	69 18	21			
.854	45 36	8.1	.922	56 41	12	.972	69 39	21			
.856	45 52	8.2	.923	56 53	12	.973	70 00	22			
.858	46 09	8.2	.924	57 05	12	.974	70 22	22			
9.860	46 25	8.3	9.925	57 17	12	9.975	70 45	23			
.862	46 42	8.4	.926	57 30	12	.976	71 08	23			
.864	46 59	8.5	.927	57 42	13	.977	71 31	24			
.866	47 16	8.6	.928	57 55	13	.978	71 55	24			
.868	47 33	8.7	.929	58 07	13	.979	72 20	25			
9.870	47 51	8.7	9.930	58 20	13	9.980	72 45	25			
.872	48 08	8.8	.931	58 33	13	.981	73 11	26			
.874	48 26	8.9	.932	58 46	13	.982	73 37	27			
.876	48 44	9.0	.933	58 59	13	.983	74 04	28			
.878	49 02	9.1	.934	59 12	13	.984	74 33	29			
9.880	49 20	9.2	9.935	59 26	13	9.985	75 02	30			
.882	49 39	9.3	.936	59 39	14	.986	75 32	31			
.884	49 58	9.4	.937	59 53	14	.987	76 03	32			
.886	50 17	9.5	.938	60 06	14	.988	76 36	33			
.888	50 36	9.6	.939	60 20	14	.989	77 10	35			
9.890	50 55	9.7	9.940	60 34	14	9.990	77 45	36			
.891	51 05	9.8	.941	60 48	14	.991	78 23	38			
.892	51 15	9.9	.942	61 03	14	.992	79 02	41			
.893	51 25	9.9	.943	61 17	14	.993	79 44	44			
.894	51 35	*10.0	.944	61 31	15	.994	80 30	47			
9.895	51 45	10.0	9.945	61 46	15	9.995	81 19				
.896	51 55	10.1	.946	62 01	15	.996	82 14				
.897	52 05	10.2	.947	62 16	15	.997	83 16				
.898	52 15	10.2	.948	62 31	15	.998	84 30				
.899	52 25	10.3	.949	62 46	15	.999	86 07				
9.900	52 36	10.4	9.950	63 02	16	0.000	90 00				
	° ′	′		° ′	′		° ′	′			

* Beyond this point the uncertainty amounts to ± 0′.5.

TRAVERSE TABLE.

course.	diff lat = dist . cos course. 1	2	3	4	5	6	7	8	9	dep = dist . sin course. 1	2	3	4	5	6	7	8	9	
0°	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	90°
1	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	0.02	0.03	0.05	0.07	0.09	0.10	0.12	0.14	0.16	89
2	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	8.99	0.03	0.07	0.10	0.14	0.17	0.21	0.24	0.28	0.31	88
3	1.00	2.00	3.00	3.99	4.99	5.99	6.99	7.99	8.99	0.05	0.10	0.16	0.21	0.26	0.31	0.37	0.42	0.47	87
4	1.00	2.00	2.99	3.99	4.99	5.99	6.98	7.98	8.98	0.07	0.14	0.21	0.28	0.35	0.42	0.49	0.56	0.63	86
5°	1.00	1.99	2.99	3.98	4.98	5.98	6.97	7.97	8.97	0.09	0.17	0.26	0.35	0.44	0.52	0.61	0.70	0.78	85°
6	0.99	1.99	2.98	3.98	4.97	5.97	6.96	7.96	8.95	0.10	0.21	0.31	0.42	0.52	0.63	0.73	0.84	0.94	84
7	0.99	1.99	2.98	3.97	4.96	5.96	6.95	7.94	8.93	0.12	0.24	0.37	0.49	0.61	0.73	0.85	0.97	1.10	83
8	0.99	1.98	2.97	3.96	4.95	5.94	6.93	7.92	8.91	0.14	0.28	0.42	0.56	0.70	0.84	0.97	1.11	1.25	82
9	0.99	1.98	2.96	3.95	4.94	5.93	6.91	7.90	8.89	0.16	0.31	0.47	0.63	0.78	0.94	1.10	1.25	1.41	81
10°	0.98	1.97	2.95	3.94	4.92	5.91	6.89	7.88	8.86	0.17	0.35	0.52	0.69	0.87	1.04	1.22	1.39	1.56	80°
11	0.98	1.96	2.94	3.93	4.91	5.89	6.87	7.85	8.83	0.19	0.38	0.57	0.76	0.95	1.14	1.34	1.53	1.72	79
12	0.98	1.96	2.93	3.91	4.89	5.87	6.85	7.83	8.80	0.21	0.42	0.62	0.83	1.04	1.25	1.46	1.66	1.87	78
13	0.97	1.95	2.92	3.90	4.87	5.85	6.82	7.79	8.77	0.22	0.45	0.67	0.90	1.12	1.35	1.57	1.80	2.02	77
14	0.97	1.94	2.91	3.88	4.85	5.82	6.79	7.76	8.73	0.24	0.48	0.73	0.97	1.21	1.45	1.69	1.94	2.18	76
15°	0.97	1.93	2.90	3.86	4.83	5.80	6.76	7.73	8.69	0.26	0.52	0.78	1.04	1.29	1.55	1.81	2.07	2.33	75°
16	0.96	1.92	2.88	3.85	4.81	5.77	6.73	7.69	8.65	0.28	0.55	0.83	1.10	1.38	1.65	1.93	2.21	2.48	74
17	0.96	1 91	2.87	3.83	4.78	5.74	6.69	7.65	8.61	0.29	0.58	0.88	1.17	1.46	1.75	2.05	2.34	2.63	73
18	0.95	1.90	2.85	3.80	4.76	5.71	6.66	7.61	8.56	0.31	0.62	0.93	1.24	1.55	1.85	2.16	2.47	2.78	72
19	0.95	1.89	2.84	3.78	4.73	5.67	6.62	7.56	8.51	0.33	0.65	0.98	1.30	1.63	1.95	2.28	2.60	2.93	71
20°	0.94	1.88	2.82	3.76	4.70	5.64	6.58	7.52	8.46	0.34	0.68	1.03	1.37	1.71	2.05	2.39	2.74	3.08	70°
21	0.93	1.87	2.80	3.73	4.67	5.60	6.54	7.47	8.40	0.36	0.72	1.08	1.43	1.79	2.15	2.51	2.87	3.23	69
22	0.93	1.85	2.78	3.71	4.64	5.56	6.49	7.42	8.34	0.37	0.75	1.12	1.50	1.87	2.25	2.62	3.00	3.37	68
23	0.92	1.84	2.76	3.68	4.60	5.52	6.44	7.36	8.28	0.39	0.78	1.17	1.56	1.95	2.34	2.74	3.13	3.52	67
24	0.91	1.83	2.74	3.65	4.57	5.48	6.39	7.31	8.22	0.41	0.81	1.22	1.63	2.03	2.44	2.85	3.25	3.66	66
25°	0.91	1.81	2.72	3.63	4.53	5.44	6.34	7.25	8.16	0.42	0.85	1.27	1.69	2.11	2.54	2.96	3.38	3.80	65°
26	0.90	1.80	2.70	3.60	4.49	5.39	6.29	7.19	8.09	0.44	0.88	1.32	1.75	2.19	2.63	3.07	3.51	3.95	64
27	0.89	1.78	2.67	3.56	4.46	5.35	6.24	7.13	8.02	0.45	0.91	1.36	1.82	2.27	2.72	3.18	3.63	4.09	63
28	0.88	1.77	2.65	3.53	4.41	5.30	6.18	7.06	7.95	0.47	0.94	1.41	1.88	2.35	2.82	3.29	3.76	4.23	62
29	0.87	1.75	2.62	3.50	4.37	5.25	6.12	7.00	7.87	0.48	0.97	1.45	1.94	2.42	2.91	3.39	3.88	4.36	61
30°	0.87	1.73	2.60	3.46	4.33	5.20	6.06	6.93	7.79	0.50	1.00	1.50	2.00	2.50	3.00	3.50	4.00	4.50	60°
31	0.86	1.71	2.57	3.43	4.29	5.14	6.00	6.86	7.71	0.52	1.03	1.55	2.06	2.58	3.09	3.61	4.12	4.64	59
32	0.85	1.70	2.54	3.39	4.24	5.09	5.94	6.78	7.63	0 53	1.06	1.59	2.12	2.65	3.18	3.71	4.24	4.77	58
33	0.84	1.68	2.52	3.35	4.19	5.03	5.87	6.71	7.55	0.54	1.09	1.63	2.18	2.72	3.27	3.81	4.36	4.90	57
34	0.83	1.66	2.49	3.32	4.15	4.97	5.80	6.63	7.46	0.56	1.12	1.68	2.24	2.80	3.36	3.91	4.47	5.03	56
35°	0.82	1.64	2.46	3.28	4.10	4.91	5.73	6.55	7.37	0.57	1.15	1.72	2.29	2.87	3.44	4.02	4.59	5.16	55°
36	0.81	1.62	2.43	3.24	4.05	4.85	5.66	6.47	7.28	0.59	1.18	1.76	2.35	2.94	3.53	4.11	4.70	5.29	54
37	0.80	1.60	2.40	3.19	3.99	4.79	5.59	6.39	7.19	0.60	1.20	1.81	2.41	3.01	3.61	4.21	4.81	5.42	53
38	0.79	1.58	2.36	3.15	3.94	4.73	5.52	6.30	7.09	0.62	1.23	1.85	2.46	3.08	3.69	4.31	4.93	5.54	52
39	0.78	1.55	2.33	3.11	3.89	4.66	5.44	6.22	6.99	0.63	1.26	1.89	2.52	3.15	3.78	4.41	5.03	5.66	51
40°	0.77	1.53	2.30	3.06	3.83	4.60	5.36	6.13	6.89	0.64	1.29	1.93	2.57	3.21	3.86	4.50	5.14	5.79	50°
41	0.75	1.51	2.26	3.02	3.77	4.53	5.28	6.04	6.79	0.66	1.31	1.97	2.62	3.28	3.94	4.59	5.25	5.90	49
42	0.74	1.49	2.23	2.97	3.72	4.46	5.20	5.95	6.69	0.67	1.34	2.01	2.68	3.35	4.01	4.68	5.35	6.02	48
43	0.73	1.46	2.19	2.93	3.66	4.39	5.12	5.85	6.58	0.68	1.36	2.05	2.73	3.41	4.09	4.77	5.46	6.14	47
44	0.72	1.44	2.16	2.88	3.60	4.32	5.04	5.75	6.47	0.69	1.39	2.08	2.78	3.47	4.17	4.86	5.56	6.25	46
45°	0.71	1.41	2.12	2.83	3.54	4.24	4.95	5.66	6.36	0.71	1.41	2.12	2.83	3.54	4.24	4.95	5.66	6.36	45°
¼pt	1.00	2.00	3.00	4.00	4.99	5.99	6.99	7.99	8.99	0.05	0.10	0.15	0.20	0.25	0.29	0.34	0.39	0.44	7¾
½	1.00	1.99	2.99	3.98	4.98	5.97	6.97	7.96	8.96	0.10	0.20	0.29	0.39	0.49	0.59	0.69	0.78	0.88	7½
¾	0.99	1.98	2.97	3.96	4.95	5.94	6.92	7.91	8.90	0.15	0.29	0.44	0.59	0.73	0.88	1.03	1.17	1.32	7¼
1	0.98	1.96	2.94	3.92	4.90	5.88	6.87	7.85	8.83	0.20	0.39	0.59	0.78	0.98	1.17	1.37	1.56	1.76	7
1¼	0.97	1.94	2.91	3.88	4.85	5.82	6.79	7.76	8.73	0.24	0.49	0.73	0.97	1.21	1.46	1.70	1.94	2.19	6¾
1½	0.96	1.91	2.87	3.83	4.78	5.74	6.70	7.66	8.61	0.29	0.58	0.87	1.16	1.45	1.74	2.03	2.32	2.61	6½
1¾	0.94	1.88	2.82	3.77	4.71	5.65	6.59	7.53	8.47	0.34	0.67	1.01	1.35	1.68	2.02	2.36	2.70	3.03	6¼
2	0.92	1.85	2.77	3.70	4.62	5.54	6.47	7.39	8.31	0.38	0.77	1.15	1.53	1.91	2.30	2.68	3.06	3.44	6
2¼	0.90	1.81	2.71	3.62	4.52	5.42	6.33	7.23	8.14	0.43	0.86	1.28	1.71	2.14	2.57	2.99	3.42	3.85	5¾
2½	0.88	1.76	2.65	3.53	4.41	5.29	6.17	7.06	7.94	0.47	0.94	1.41	1.89	2.36	2.83	3.30	3.77	4.24	5½
2¾	0.86	1.72	2.57	3.43	4.29	5.15	6.00	6.86	7.72	0.51	1.03	1.54	2.06	2.57	3.08	3.60	4.11	4.63	5¼
3	0.83	1.66	2.49	3.33	4.16	4.99	5.82	6.65	7.48	0.56	1.11	1.67	2.22	2.78	3.33	3.89	4.44	5.00	5
3¼	0.80	1.61	2.41	3.21	4.02	4.82	5.62	6.43	7.23	0.60	1.19	1.79	2.38	2.98	3.57	4.17	4.77	5.36	4¾
3½	0.77	1.55	2.32	3.09	3.87	4.64	5.41	6.18	6.96	0.63	1.27	1.90	2.54	3.17	3.81	4.44	5.08	5.71	4½
3¾	0.74	1.48	2.22	2.96	3.70	4.45	5.19	5.93	6.67	0.67	1.34	2.01	2.69	3.36	4.03	4.70	5.37	6.04	4¼pt
	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	course.
	dep = dist . sin course.									diff lat = dist . cos course.									

Correction of Middle Latitude Sailing.

Middle Latitude.	*Add* to *log sec*, or *subtract* from *log cos*, of mid lat, if diff lat = 10°.
0°	0.00055
5	56
10	59
15	63
20	70
25	79
26°	0.00082
27	84
28	86
29	89
30	92
31°	0.00095
32	098
33	102
34	106
35	110
36°	0.00114
37	118
38	123
39	128
40	133
41°	0.00139
42	145
43	152
44	159
45	166
46°	0.00174
47	183
48	192
49	202
50	213
51°	0.00225
52	238
53	251
54	266
55	283
56°	0.00300
57	320
58	341
59	365
60	391
61°	0.00419
62	451
63	487
64	527
65	572
66°	0.00623
67	681
68	747
69	823
70	912
71°	0.01016
72	1138
73	1284
74	1459
75	1673

For a given mid lat, the correction is nearly proportional to the *square of the diff lat.*

MERIDIONAL PARTS.

	0°	10°	20°	30°	40°	50°	60°	70°	80°	85°	87°	89°
0° 00′	0	603	1225	1888	2623	3474	4527	5966	80° 00′ 8375	85° 00′ 10765	87° 00′ 12522	89° 00′ 16300
10	10	613	1236	1900	36	90	47	95	05 8404	02 788	02 561	01 357
20	20	623	46	12	49	3506	68	6025	10 33	04 811	04 599	02 416
30	30	634	57	23	62	21	88	55	15 63	06 834	06 639	03 476
40	40	644	68	35	75	37	4608	85	20 92	08 858	08 678	04 537
50	50	654	78	46	88	53	29	6115	25 8522	10′ 10881	10′ 12719	05′ 16599
1° 00′	60	664	1289	1958	2702	3569	4649	6146	30′ 8552	12 905	12 759	06 662
10	70	674	1300	70	15	85	70	77	35 83	14 929	14 801	07 726
20	80	684	11	81	28	3601	91	6208	40 8614	16 953	16 842	08 792
30	90	695	21	93	42	17	4712	39	45 44	18 978	18 884	09 858
40	100	705	32	2005	55	33	33	71	50 76	20′ 11002	20′ 12927	10′ 16926
50	110	715	43	17	68	49	54	6303	55 8707	22 027	22 970	11 996
2° 00′	120	725	1354	2028	2782	3665	4775	6335	81° 00′ 8739	24 052	24 13014	12 17067
10	130	736	64	40	95	81	96	67	05 71	26 077	26 059	13 139
20	140	746	75	52	2809	98	4818	6400	10 8804	28 102	28 104	14 213
30	150	756	86	64	22	3714	39	33	15 36	30′ 11127	30′ 13149	15′ 17289
40	160	766	97	76	36	31	61	67	20 69	32 153	32 195	16 366
50	170	777	1408	88	49	47	83	6500	25 8903	34 179	34 242	17 445
3° 00′	180	787	1419	2100	2863	3764	4905	6534	30′ 8936	36 205	36 290	18 526
10	190	797	30	11	77	80	27	69	35 70	38 231	38 338	19 609
20	200	807	40	23	91	97	49	6603	40 9005	40′ 11257	40′ 13386	20′ 17693
30	210	818	51	35	2904	3814	72	39	45 39	42 284	42 436	21 781
40	220	828	62	47	18	31	94	74	50 74	44 310	44 486	22 870
50	230	838	73	59	32	48	5017	6710	55 9110	46 337	46 537	23 962
4° 00′	240	848	1484	2171	2946	3865	5039	6746	82° 00′ 9145	48 365	48 589	24 18056
10	250	859	95	84	60	82	62	82	05 82	50′ 11392	50′ 13641	25′ 18153
20	260	869	1506	96	74	99	85	6819	10 9218	52 420	52 695	26 252
30	270	879	17	2208	88	3916	5108	56	15 55	54 448	54 749	27 355
40	280	890	28	20	3002	33	32	94	20 92	56 476	56 804	28 461
50	290	900	39	32	16	51	55	6932	25 9330	58 504	58 860	29 570
5° 00′	300	910	1550	2244	3030	3968	5179	6970	30′ 9368	86° 00′ 11533	88° 00′ 13916	30′ 18682
10	310	921	61	57	44	85	5203	7009	35 9407	02 561	02 974	31 799
20	320	931	72	69	58	4003	26	48	40 45	04 590	04 14033	32 920
30	331	942	83	81	73	21	50	88	45 85	06 620	06 093	33 19045
40	341	952	94	93	87	38	75	7128	50 9525	08 649	08 154	34 174
50	351	962	1605	2306	3101	56	99	69	55 65	10′ 11679	10′ 14216	35′ 19309
6° 00′	361	973	1616	2318	3116	4074	5324	7210	83° 00′ 9606	12 709	12 279	36 450
10	371	983	28	30	30	92	48	52	05 47	14 739	14 343	37 596
20	381	994	39	43	44	4110	73	94	10 89	16 770	16 408	38 749
30	391	1004	50	55	59	28	98	7336	15 9731	18 801	18 475	39 909
40	401	1014	61	68	73	46	5423	79	20 74	20′ 11832	20′ 14543	40′ 20076
50	411	1025	72	80	88	64	48	7423	25 9817	22 863	22 613	41 253
7° 00′	421	1035	1684	2393	3203	4183	5474	7467	30′ 9861	24 895	24 684	42 439
10	431	1046	95	2405	17	4201	5500	7512	35 9906	26 927	26 756	43 635
20	441	1056	1706	18	32	20	26	57	40 51	28 959	28 830	44 843
30	451	1067	17	30	47	38	52	7603	45 96	30′ 11992	30′ 14906	45′ 21065
40	461	1077	29	43	62	57	78	50	50 10043	32 12025	32 983	46 303
50	471	1088	40	56	77	75	5604	97	55 89	34 058	34 15062	47 557
8° 00′	482	1098	1751	2468	3292	4294	5631	7745	84° 00′ 10137	36 092	36 143	48 832
10	492	1109	62	81	3306	4313	58	93	05 85	38 125	38 226	49 22132
20	502	1119	74	94	22	32	85	7842	10 10234	40′ 12160	40′ 15311	50′ 22459
30	512	1130	85	2506	37	51	5712	92	15 83	42 194	42 398	51 821
40	522	1140	97	19	52	70	39	7942	20 10334	44 229	44 487	52 23226
50	532	1151	1808	32	67	90	67	94	25 85	46 264	46 579	53 685
9° 00′	542	1161	1819	2545	3382	4409	5795	8046	30′ 10437	48 300	48 673	54 24215
10	552	1172	31	58	97	29	5823	99	35 89	50′ 12336	50′ 15770	55′ 24842
20	562	1183	42	71	3413	48	51	8152	40 10542	52 373	52 869	56 25609
30	573	1193	54	84	28	68	79	8207	45 97	54 409	54 972	57 26598
40	583	1204	65	97	43	88	5908	62	50 10652	56 447	56 16078	58 27992
50	593	1215	77	2610	59	4507	37	8318	55 10708	58 484	58 187	59 30375
10° 00′	603	1225	1888	2623	3474	4527	5966	8375	85° 00′ 10765	87° 00′ 12522	89° 00′ 16300	90° 00′ ∞

Name of Constant.	Value.	log.	colog.	Reciprocal.	Name of Reciprocal.
$\mathfrak{C} = \lim \sqrt[\epsilon]{(1+\epsilon)} = \Sigma(n!)^{-1}$ = natural exponential base	2.7182818285	0.4342*9448+	9.5657 0552–	0.3678794412	$\mathfrak{C}^{-1} = \lim \sqrt[\epsilon]{(1-\epsilon)} = \Sigma(-1)^n (n!)^{-1}$
μ = dec log $\mathfrak{C}$ = ratio of decimal logs to natural logs	0.4342944819	9.6377*8431+	0.3622 1569–	2.3025850930	μ^{-1} = nat log 10 = ratio of natural logs to decimal logs.
$\mathfrak{I}$ = ratio of circumference of circle to diameter	3.1415926536	0.4971 4987+	9.5028*5013–	0.3183098862	$\mathfrak{I}^{-1}$ = ratio of diameter of circle to circumference.
ν = arc 1′ in terms of radius as unity	0.0002908882	6.4637 2612–	3.5362*7388+	3437.7467708	ν^{-1} = radius (or unit-arc) in minutes.
$\mu\nu$ = multiplier for derivatives of dec log trig fns of minutes	0.0001263311	6.1015 1043–	3.8984*8957+	7915.7044679	$(\mu\nu)^{-1}$ = multiplier for integrals of log trig fns of minutes.
$\sqrt{\mathfrak{C}^{\mathfrak{I}}} = i^{-i} = \sqrt[i]{i}$ = dec log^{-1} $(\frac{1}{2}\,\mathfrak{I}\,\mu)$	4.8104773810	0.6821*8818–	9.3178 1182+	0.2078795763	$\sqrt{\mathfrak{C}^{-\mathfrak{I}}} = i = \sqrt[i]{i}$ = dec log^{-1} $(-\frac{1}{2}\,\mathfrak{I}\,\mu)$
one Parisian line in millimetres (0.001 m)	2.2558291	0.3533 062	9.6466*938	0.443296	one millimetre (0.001 m) in Parisian lines.
one English inch in centimetres (0.01 m)	2.5399772	0.4048 298	9.5951*702	0.39370432	one centimetre (0.01 m) in English inches.
one English foot in metres (m)	0.30479727	9.4840 111	0.5159*889	3.28086933	one metre (m) in English feet.
one yard in metres (m)	0.91439180	9.9611 323	0.0388*677	1.09362311	one metre (m) in yards.
one toise (864 [2.9365] lines) in metres (m)	1.94903632	0.2898 199	9.7101*801	0.51307407	one metre (m) in toises.
one fathom (6 English feet) in metres (m)	1.8287836	0.2621*623	9.7378 377	0.54681156	one metre (m) in fathoms.
one rod (16.5 [1.2175] feet) in metres (m)	5.0291549	0.7014*950	9.2985 050	0.19884057	one metre (m) in rods.
one surveyor's chain (66 [1.8195] feet) in decametres (10 m)	2.0116620	0.3035*550	9.6964 450	0.49710142	one decametre (10 m) in surveyor's chains.
one Eng. statute mile (5280 [3.7226] ft) in kilometres (1000 m)	1.6093295	0.2066 450	9.7933*550	0.62137677	one kilometre (1000 m) in English statute miles.
one nautical mile in kilometres (1000 m)	1.852	0.2676	9.7324	0.540	one kilometre (1000 m) in nautical miles.
one square foot in centiares $(m)^2$	0.092901374	8.9680 221	1.0319*779	10.764104	one centiare $(m)^2$ in square feet.
one acre (43560 [4.6391] sq. ft.) in hectares (100 m)^2	0.40467838	9.6071 100	0.3928*900	2.4710982	one hectare (100 m)^2 in acres.
one square mile (640 [2.8062] acres) in hectares (100 m)^2	258.99416	2.4132*900	7.5867 100	0.0038610909	one hectare (100 m)^2 in square miles.
one cubic foot in steres $(m)^3$	0.028316085	8.4520 332	1.5479*668	35.315617	one stere $(m)^3$ in cubic feet.
one cord (128 [2.1072] cub. ft.) in steres $(m)^3$	3.6244589	0.5592 432	9.4407*568	0.2759033	one stere $(m)^3$ in cords.
one imperial gallon in litres (0.1 m)^3	4.5435845	0.6573*986	9.3426 014	0.2200906	one litre (0.1 m)^3 in imperial gallons.
one imperial gallon in cubic inches	277.274	2.4429 091	7.5570*909	0.00360654	one cubic inch in imperial gallons.
one grain in grammes (g)	0.0647989504	8.8115*680	1.1884 320	15.43234874	one gramme (g) in grains.
one troy lb. (5760 [3.7604] grains) in kilogrammes (1000 g)	0.3732419539	9.5719*905	0.4280 095	2.679227212	one kilogramme (1000 g) in troy pounds.
one avoird. lb. (7000 [3.8451] grains) in kilogrammes (1000 g)	0.4535926525	9.6566*660	0.3433 340	2.204621249	one kilogramme (1000 g) in avoirdupois pounds.
one footpound (avoirdupois) in kilogramme-metres	0.13825380	9.1406*771	0.8593 229	7.2330743	one kilogramme-metre in footpounds.

The English measures named above are the imperial standards of Great Britain, and the comparisons are derived from the latest determinations. (See *Phil. Trans.* for 1856, 1857, 1867.)
The U. S. standards of length and weight and the imperial standards are theoretically identical. The U. S. gallon and bushel represent old English measures.

ratio of U. S. actual standard yard to imperial do.	1.000024	0.0000 104	9.9999*896	0.999976	ratio of imperial standard yard to U. S. actual do.
ratio of U. S. actual standard grain to imperial do.	0.99999986	9.9999*999	0.0000 001	1.00000014	ratio of imperial standard grain to U. S. actual do.
one U. S. (wine) gallon in litres (0.1 m)^3	3.785	0.5780	9.4220	0.264	one litre (0.1 m)^3 in U. S. (wine) gallons.
one U. S. gallon in cubic inches	231.	2.3636	7.6364	0.00433	one cubic inch in U. S. gallons.
one U. S. gallon in imperial gallons	0.83311	9.9207	0.0793	1.2003	one imperial gallon in U. S. gallons.
one U. S. (or Winchester) bushel in litres (0.1 m)^3	35.24	1.5470	8.4530	0.02838	one litre (0.1 m.)^3 in U. S. (or Winchester) bushels.
one U. S. bushel in cubic inches	2150.42	3.3325	6.6675	0.000465	one cubic inch in U. S. bushels.
one U. S. bushel in imperial bushels (8 imp. galls.)	0.9695	9.9865	0.0135	1.032	one imperial bushel in U. S. bushels.
weight in grains of 1 $(in)^3$ dist. water (in air 62° F., 30 in. bar.)	252.458	2.4021*891	7.5978 109	0.00396106	vol. in $(in)^3$ of 1 grain dist. water (in air, 62° F., 30 in. bar.)

one imp. gall. contains 10 pounds avoird. of distilled water, weighed as above. one litre contains one kilogramme of distilled water, at max. density, in vac.

seconds' pendulum, in latitude ϕ, } { 0.9936 [9.9972] metres = 39.12 [1.5924] inches
acceleration of gravity, in latitude ϕ, } { 9.8060 [0.9915] metres per sec. = 32.17 [1.5075] feet per sec. } $\times (1 - 0.00256\ [7.4081] \cos 2\phi)$.

mechanical equivalent of the heat required to raise 1 lb. of water 1° Fahr., in footpounds, 772 [2.8876]; do. for 1 kilogramme of water, 1° centigrade, in kilogramme-metres, 424 [2.6269].

velocity of light in space (Foucault), 298,000 [5.4742] kilometres per second = 185,000 [5.2676] miles per second.

velocity of sound in air at t° centigrade, (333.1 [2.5225] metres per second = 1093 [3.0385] feet per second) $\times (1 + 0.001833\ [7.2630]\ t)$.

earth's equatorial semiaxis in kilometres, 6377 [3.8046]; polar semiaxis in kilometres, 6356 [3.8032]; radius of earth as a sphere, 6370 [3.8042] kilometres = 3958 miles [3.5975].

sun's diam., 1,370,000 [6.1367] kil.; mean dist. fr. earth, 148,000,000 [8.1703] kil. = 92 mill. miles; ratio of mass to earth's, 318,000 [5.5024]; ratio of density to earth's, 0.25 [9.3979].

tropical year in mean solar days, 365.2422 [2.56258]; sidereal year in mean solar days, 365.2564 [2.56260]; solar day — sidereal day, in solar seconds, 235.91 [2.3727].

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